MDS-SD1

SERVICE MANUAL

AEP Model
UK Model
E Model

Self Diagnosis Supported model

MDS-SD1 is the minidisc deck that can be used only with section CMT-SD1/SD3.

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-JE520
MD Mechanism Type	MDM-5A
Base Unit Type	MBU-5A
Optical Pick-up Type	KMS-260A/J1N

SPECIFICATIONS

System	MiniDisc digital audio system
Laser	Semiconductor laser (λ=780 nm) Emission duration: continuous
Laser output	Max. 44.6 μW* *This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with a 7 mm aperture.
Recording time	74 minutes max. (using MDW-74, stereo) 148 minutes max. (using MDW-74, monaural)
Sampling frequency	44.1 kHz
Frequency response	20 - 20,000 Hz
Input	CD IN: Optical DIGITAL OPTICAL IN: Optical MD WM LINK CONTROL I
Output	DIGITAL OUT: Optical

General

Power requirements	
European model:	230 V AC, 50/60 Hz
Other models:	220 - 240 V AC, 50/60 Hz
Power consumption	10 W (Normal)
Dimensions	190 x 91 x 315 mm (w/h/d, incl. projecting parts and controls)
Mass	Approx. 2.4 kg
Supplied accessories	Optical digital cord (1) Audio cords (2) System cable (1) MD Walkman cable (1)

Designs and specifications are subject to change without notice

MINIDISC DECK

MICROFILM

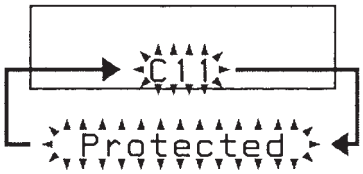
SONY®

SELF-DIAGNOSIS FUNCTION

The self-diagnosis function consists of error codes for customers which are displayed automatically when errors occur, and error codes which show the error history in the test mode during servicing. For details on how to view error codes for the customer, refer to the following box in the instruction manual. For details on how to check error codes during servicing, refer to the following "Procedure for using the Self-Diagnosis Function (Error History Display Mode)".

Self-diagnosis Display

This system has the Self-diagnosis display function to let you know if there is a system malfunction. The display shows a code made up of three letters and a message alternately to show you the problem. To solve the problem refer to the following list. If any problem persists, consult your nearest Sony dealer.



C11 / Protected
The MD is protected against erasure.
→Remove the MD and slide the tab to close the slot (page 16).

C12 / Cannot Copy
The MD is an incompatible format type.
→Change the MD with another one.

C13 / REC Error
Recording is not possible.
→Move the system to a stable place and start recording over from the beginning.
The MD is dirty or is scratched or the MD does not meet the standards.
→Change the MD with another one and start recording over from the beginning.

C13 / Read Error
The MDS-SD1 cannnot read the disc information correctly.
→Eject the MD once, then insert it again.

C14 / Toc Error
The MDS-SD1 cannnot read the disc information correctly.
→Change the MD with another one.
→Erase all the recorded contents of the MD using the Erase function on page 29.

C41 / Cannot Copy
This unit complies with the Serial Copy Management System (SCMS) which limits the number of digital copies that can be made of any given digital audio source (page 44).

C71 / Check OPT-IN
You tried to record from the digital component when no component is connected to AUX IN 2 jack or the digital component is not connected correctly.
→Connect the digital component correctly to AUX IN 2 jack with a digital optical cable.
The power of the connected digital component is off.
→Turn on the digital component.

Procedure for using the Self-Diagnosis Function (Error History Display Mode).

Note: Perform the self-diagnosis function in the "error history display mode" in the test mode. The following describes the least required procedure. Be careful not to enter other modes by mistake. If you set other modes accidentally, press the MENU/NO button to exit the mode.

1. While pressing the ENTER/YES button and ☐ button, connect the power plug to the outlet, and release the ENTER/YES button and ☐ button.
2. "TEMP CHECK" will be displayed. Press the MENU/NO button to display "Check".
3. Rotate the – ⟷ + knob and when "[Service]" is displayed, press the ENTER/YES button.
4. Rotate the – ⟷ + knob and display "ERR DP MODE".
5. Pressing the ENTER/YES button sets the error history mode and displays "total rec".
6. Select the contents to be displayed or executed using the – ⟷ + knob.
7. Pressing the CD SYNC/MD WM SYNC button will display or execute the contents selected.
8. Pressing the CD SYNC/MD WM SYNC button another time returns to step 5.
9. Pressing the MENU/NO button displays "ERROR DP MODE" and exits the error history mode.
10. To exit the test mode, press the I/⏻ button. The unit sets into the STANDBY state, the disc is ejected, and the test mode ends.

ITEMS OF ERROR HISTORY MODE ITEMS AND CONTENTS

Selecting the Test Mode

Display	Details of History
total rec	Displays the recording time. Displayed as "r□□□□□□h". The displayed time is the total time the laser is set to the high power state. This is about 1/4 of the actual recording time. The time is displayed in decimal digits from 0h to 65535h.
total play	Displays the play time. Displayed as "p□□□□□□h". The time displayed is the total actual play time. Pauses are not counted. The time is displayed in decimal digits from 0h to 65535h.
retry err	Displays the total number of retries during recording and number of retry errors during play. Displayed as "r□□ p□□". "r" indicates the retries during recording while "p" indicates the retry errors during play. The number of retries and retry errors are displayed in hexadecimal digits from 00 to FF.
total err	Displays the total number of errors. Displayed as "total □□". The number of errors is displayed in hexadecimal digits from 00 to FF.
err history	Displays the 10 latest errors. Displayed as "0□ E@@". □ indicates the history number. The smaller the number, the more recent is the error. (00 is the latest). @@ indicates the error code. Refer to the following table for the details. The error history can be switched by rotating the [– ⟷ +] knob.
er refresh	Mode which erases the "retry err", "total err", and "err history" histories. When returning the unit to the customer after completing repairs, perform this to erase the past error history, After pressing the [CD SYNC/MD WM SYNC] button and "er refresh?" is displayed, press the [ENTER/YES] button to erase the history. "Complete!" will be displayed momentarily. Be sure to check the following when this mode has been executed. • The data has been erased. • The mechanism operates normally when recording and play are performed.
tm refresh	Mode which erases the "total rec" and "total play" histories. These histories serve as approximate indications of when to replace the optical pickup. If the optical pickup has been replaced, perform this operation and erase the history. After pressing the [CD SYNC/MD WM SYNC] button and "tm refresh?" is displayed, press the [ENTER/YES] button to erase the history. "Complete!" will be displayed momentarily. Be sure to check the following when this mode has been executed. • The data has been erased. • The mechanism operates normally when recording and play are performed.

Table of Error Codes

Error Code	Details of Error	Error Code	Details of Error
E00	No error	E05	FOK has deviated
E01	Disc error. PTOC cannot be read (DISC ejected)	E06	Cannot focus (Servo has deviated)
		E07	Recording retry
E02	Disc error. UTOC error (DISC not ejected)	E08	Recording retry error
		E09	Playback retry error (Access error)
E03	Loading error		
E04	Address cannot be read (Servo has deviated)	E0A	Play retry error (C2 error)

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilakting skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

VARNIG

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreakrifter.

VAROITUS

Parist voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHEREITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLING LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVERSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYAZAT! : A BURKOLAT NYITÁSAKOR LÁTHATATLAN LÉZERSUGÁRVESZÉLY! KERÜLJE A BESUGÁRZÁST!

This caution label is located inside the unit.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

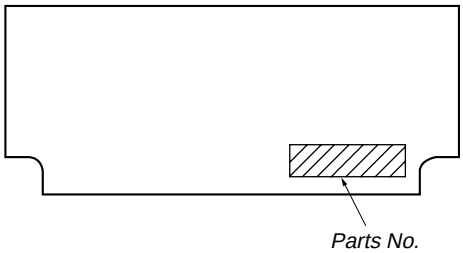
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

MODEL IDENTIFICATION
– Specification Label –



MODEL	PARTS No.
AEP, UK model	4-212-572-1☐
SP, HK model	4-212-572-2☐

- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

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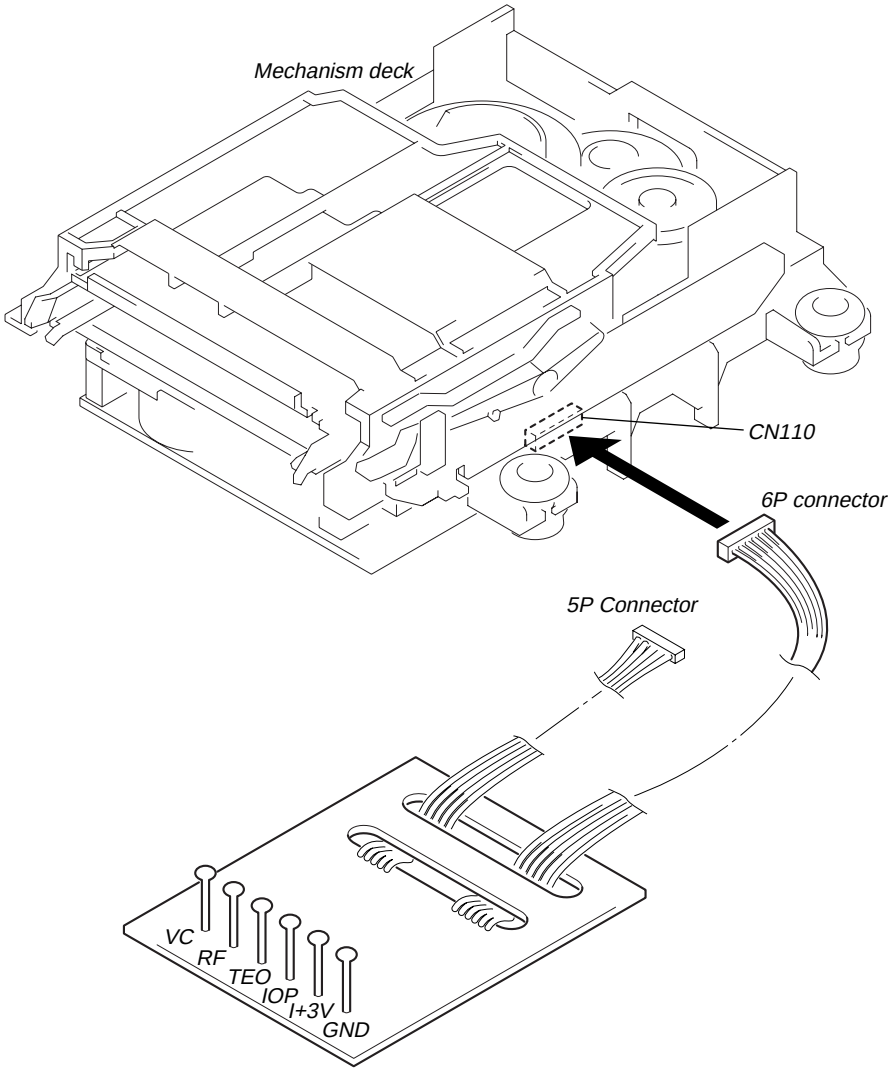
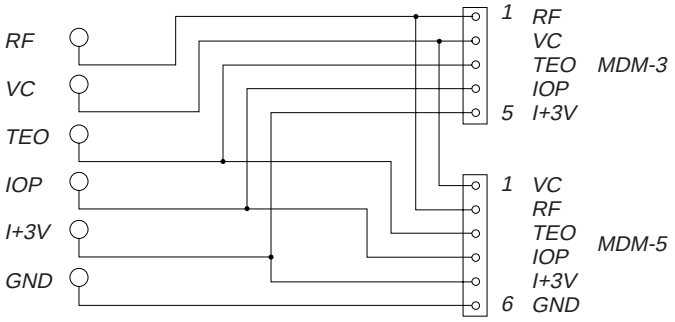
SECTION 1
SERVICING NOTE

JIG FOR CHECKING BD BOARD WAVEFORM

The special jig (J-2501-149-A) is useful for checking the waveform of the BD board. The names of terminals and the checking items to be performed are shown as follows.

GND : Ground
I+3V : For measuring IOP (Check the deterioration of the optical pick-up laser)
IOP : For measuring IOP (Check the deterioration of the optical pick-up laser)
TEO : TRK error signal (Traverse adjustment)
RF : RF signal (Check jitter)
VC : Reference level for checking the signal





IOP DATA RECORDING AND DISPLAY WHEN PICKUP AND NON-VOLATILE MEMORY (IC171 OF BD BOARD) ARE REPLACED

The IOP value labeled on the pick-up can be recorded in the non-volatile memory. By recording the value, it will eliminate the need to look at the value on the label of the optical pick-up. When replacing the pick-up or non-volatile memory (IC171 of BD board), record the IOP value on the pick-up according to the following procedure.

Record Precedure:

1. While pressing the [ENTER/YES] button and [☐] button, connect the power plug to the outlet, and release the [ENTER/YES] button and [☐] button.
2. "TEMP CHECK" will be displayed. Press the [MENU/NO] button to display "Check".
3. Rotate the [– ⟷ +] knob to display "[Service]", and press the [ENTER/YES] button.
4. Rotate the [– ⟷ +] knob to display "lop.Write", and press the [ENTER/YES] button.
5. The display becomes "Ref=@@@.@" (@ is an arbitrary number) and the numbers which can be changed will blink.
6. Input the IOP value written on the optical pick-up.
   To select the number : Rotate the [– ⟷ +] knob.
   To select the digit : Press the [CD SYNC/MD WM SYNC] button.
7. When the [ENTER/YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
8. As the adjustment results are recorded for the step 6 value. Leave it as it is and press the [ENTER/YES] button.
9. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".
10. Press the [I/⏻] button to complete. "Standby" will be displayed.

Display Precedure:

1. While pressing the [ENTER/YES] button and [☐] button, connect the power plug to the outlet, and release the [ENTER/YES] button and [☐] button.
2. "TEMP CHECK" will be displayed. Press the [MENU/NO] button to display "Check".
3. Rotate the [– ⟷ +] knob to display "[Service]", and press the [ENTER/YES] button.
4. Rotate the [– ⟷ +] knob to display "lop.Read".
5. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ : indicates the Iop value labeled on the pick-up.
   ##.# : indicates the Iop value after adjustment
6. To end, press the [CD SYNC/MD WM SYNC] button or [MENU/NO] button to display "Iop Read". Then press the [I/⏻] button to display "Standby".

CHECKS PRIOR TO PARTS REPLACEMENT AND ADJUSTMENTS

Before performing repairs, perform the following checks to determine the faulty locations up to a certain extent.
Details of the procedures are described in "5 Electrical Adjustments".

	Criteria for Determination (Unsatisfactory if specified value is not satisfied)	Measure if unsatisfactory:
Laser power check (5-6-2 : See page 25)	• 0.9 mW power Specified value : 0.84 to 0.92 mW • 7.0 mW power Specified value : 6.8 to 7.2 mW	• Clean the optical pick-up • Adjust again • Replace the optical pick-up
	lop (at 7mW) • Labeled on the optical pickup Iop value ± 10mA	• Replace the optical pick-up
Traverse check (5-6-3 : See page 25)	• Traverse waveform Specified value : Below 10% offset	• Replace the optical pick-up
Focus bias check (5-6-4 : See page 26)	• Error rate check Specified value : For points a, b, and c C1 error : Below 220 AD error : Below 2	• Replace the optical pick-up
C PLAY check (5-6-5 : See page 26)	• Error rate check Specified value: a. When using test disc (MDW-74/AU-1) C1 error : Below 80 AD error : Below 2 b. When using check disc (TDYS-1) C1 error : Below 50	• Replace the optical pick-up
Self-recording/playback check (REC/PLAY) (5-6-6 : See page 26)	• CPLAY error rate check Specified value: C1 error : Below 80 AD error : Below 2	If always unsatisfactory: • Replace the overwrite head • Check for disconnection of the circuits around the overwrite head
		If occasionally unsatisfactory: • Check if the overwrite head is distorted • Check the mechanism around the sled
TEMP check (Temperature compensation offset check) (5-6-1 : See page 25)	• Unsatisfactory if displayed as T=@@ (##) [NG]" NG (@@, ## are both arbitrary numbers)	• Check for disconnection of the circuits around D101 (BD board) • Check the signals around IC101, IC121, CN102, CN103 (BD board)

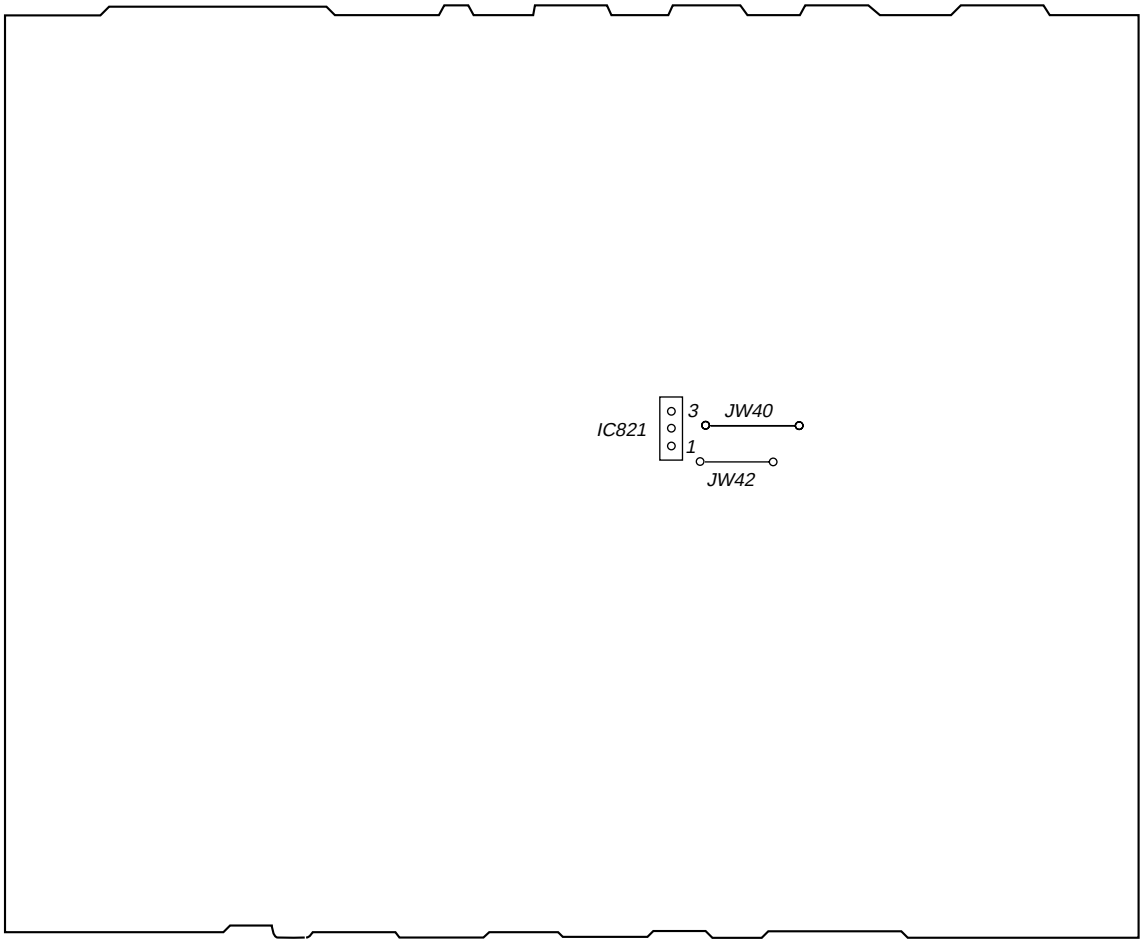
Note:
The criteria for determination above is intended merely to determine if satisfactory or not, and does not serve as the specified value for adjustments.
When performing adjustments, use the specified values for adjustments.

FORCED RESET

The system microprocessor can be reset in the following procedure.
Use these procedure when the unit cannot be operated normally due to the overrunning of the microprocessor, etc.

Procedure :
Short-circuit jumper wire of JW40 and JW41 (RESET).

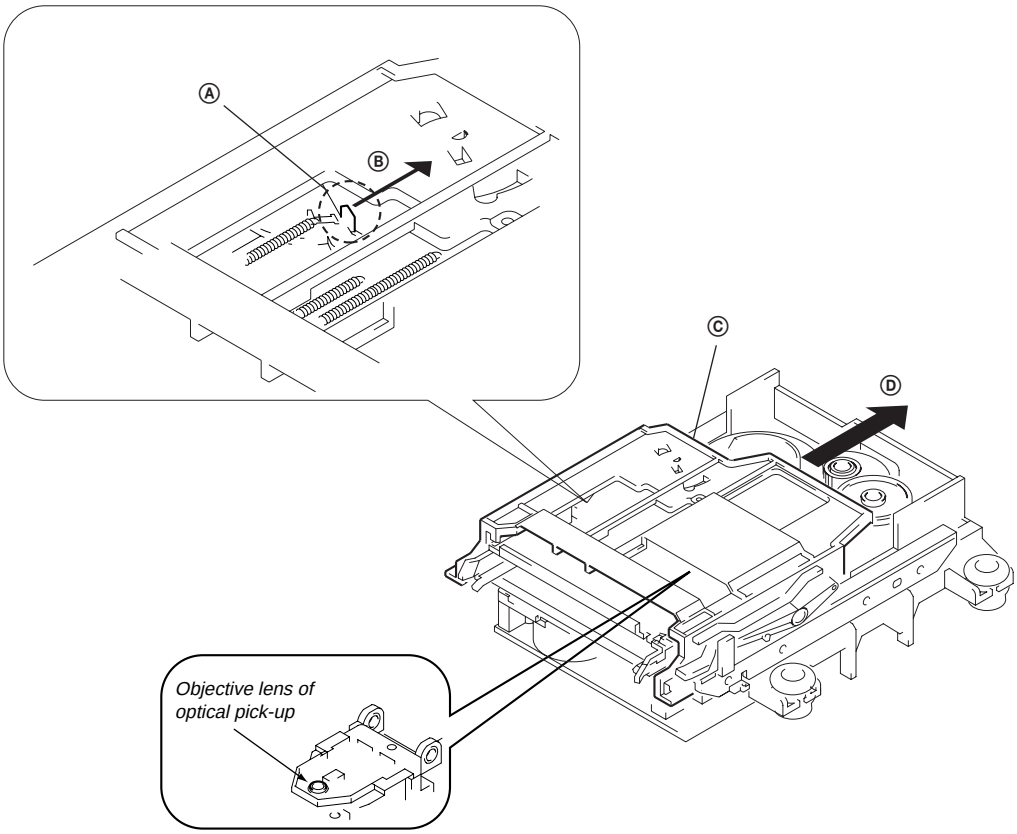
[MAIN BOARD] (Component Side)



CLEANING OF OBJECTIVE LENS OF OPTICAL PICKUP

• When cleaning the objective lens of the optical pickup, move the mechanism deck using the following method.

① If a disc is inside, eject it out.
② Disconnect the power cord from the outlet, and set the non-conducted state.
③ Using a pair of tweezers, while pulling the claw at Ⓐ towards Ⓑ, move part Ⓒ in direction Ⓓ.
④ Move part Ⓒ to a position which allows it to be cleaned easily, and clean.

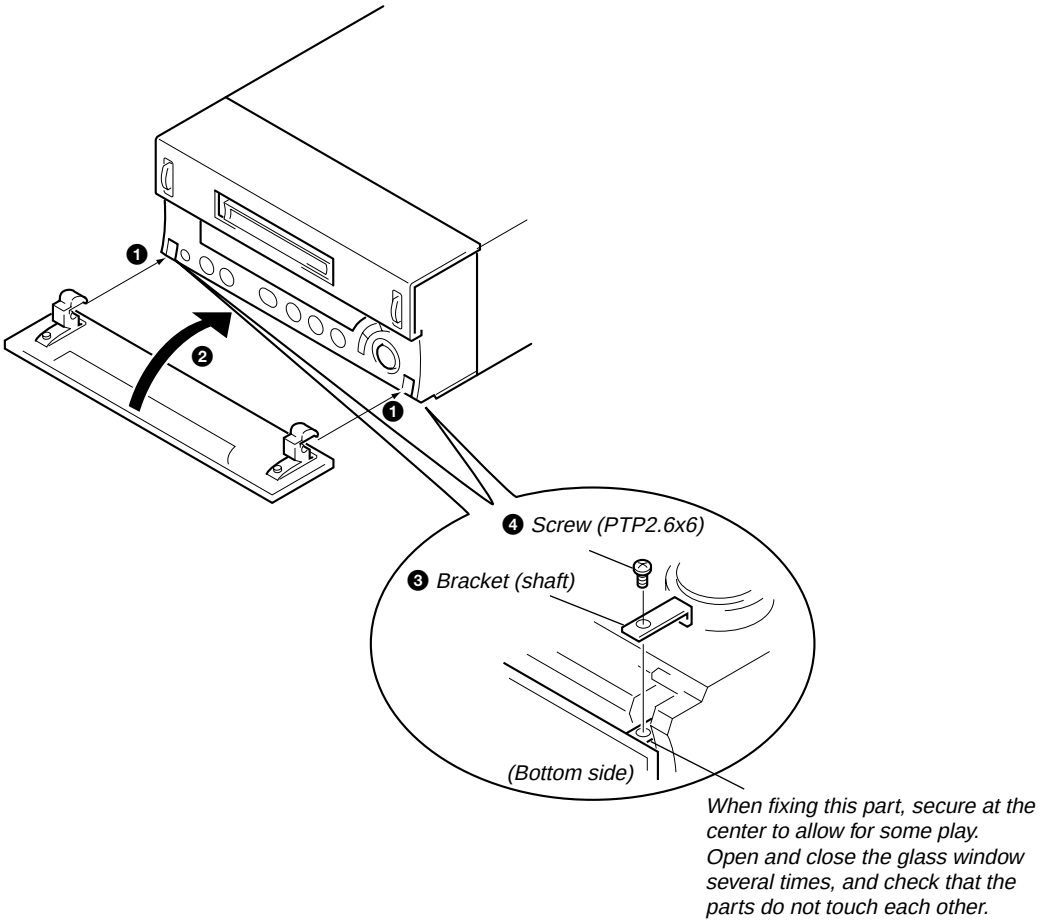


FLUORESCENT INDICATOR TUBE AND MECHANISM DECK

• The fluorescent indicator tube will not display anything if the mechanism deck is not connected to the MAIN board. Before servicing, check the connection of the cables connecting these parts first.

ATTACHING THE GLASS ASSEMBLY

• Attach according to steps ❶ to ❹.



When fixing this part, secure at the center to allow for some play. Open and close the glass window several times, and check that the parts do not touch each other.

FLUORESCENT INDICATOR TUBE, LED COMPLETE LIGHTING CHECK

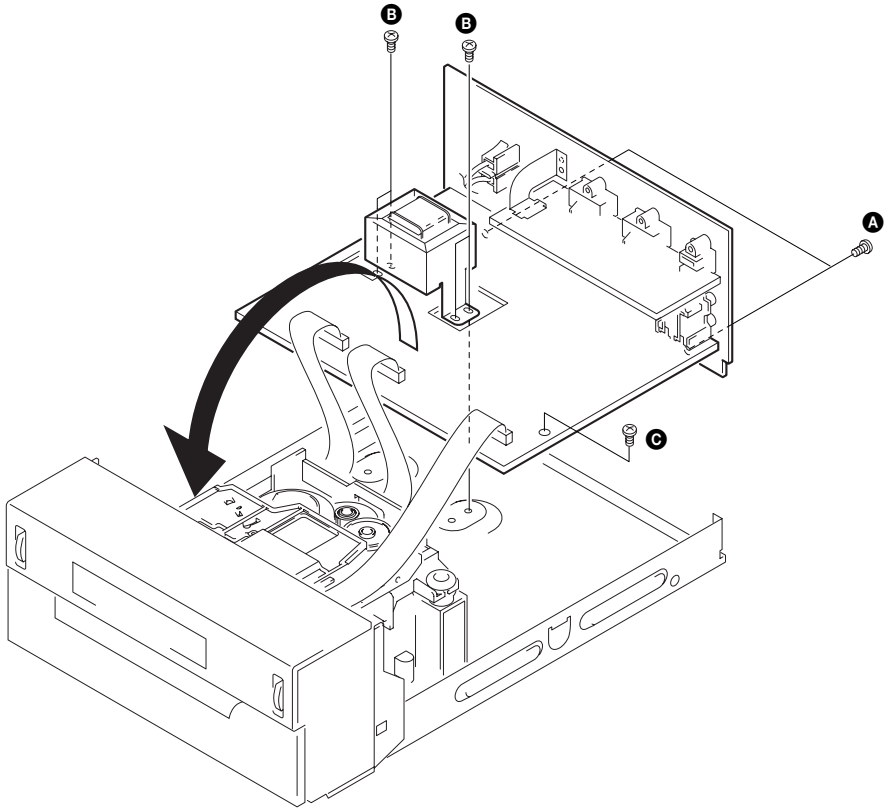
• The fluorescent indicator tube and LED complete lighting and key check mode of this unit can be performed as follows.

Procedure:

1. While pressing the [ENTER/YES] and [●REC] buttons, insert the power plug into the outlet, and turn ON the power.
2. "FL All On Key" will be displayed momentarily, after which immediately the fluorescent indicator tube and LED will light up completely.
3. The fluorescent display tube will go off part by part each time a button is pressed. When all buttons have been pressed, "Push Yen" will be displayed.
4. When the [ENTER/YES] button is pressed next, "Seg Chk" will be displayed momentarily.
5. Checkered pattern will be displayed on the fluorescent display tube.
6. When the [ENTER/YES] button is pressed next, "Jog & LED Chk" will be displayed.
7. The LED lighting state changes each time the [– ⟷ +] knob is rotated.
   (The LED will stop reacting after the knob has been rotated to some extent. This is not a fault.)
8. When the [ENTER/YES] button is pressed, "Check End" will be displayed on the fluorescent indicator tube, and the check mode ends.

SERVICING POSITION

❶ Remove the four screws securing the upper cover, and remove the upper cover.
❷ Undo the bound cables.
❸ Remove the two screws Ⓐ securing the rear panel.
❹ Remove the four screws Ⓑ securing the transformer.
❺ Remove the screw Ⓒ securing the MAIN board.
❻ Remove the MAIN board with the rear panel.



RETRY CAUSE DISPLAY MODE

- In this test mode, the causes for retry of the unit during recording can be displayed on the fluorescent indicator tube. During playback, the "track mode" for obtaining track information will be set.
  This is useful for locating the faulty part of the unit.
- The following will be displayed :
  During recording and stop : Retry cause, number of retries, and number of retry errors.
  During playback : Information such as type of disc played, part played, copyright.
  These are displayed in hexadecimal.

Precedure:

1. Load a recordable disc whose contents can be erased into the unit.
2. Press the [MENU/NO] button. When "Edit/Menu" is displayed on the fluorescent indicator tube, rotate the [– ⟷ +] knob to display "All Erase?".
3. Press the [ENTER/YES] button.
4. When "All Erase??" is displayed on the fluorescent indicator tube.
5. Press the [ENTER/YES] button to display "Complete!!", and press the [□] button immediately. Wait for about 15 seconds while pressing the button.
6. When the "TOC" displayed on the fluorescent indicator tube goes off, release the [□] button.
7. Press the [● REC] button to start recording. Then press the [▷II] button and start recording.
8. To check the "track mode", press the [▷II] button to start play.
9. To exit the test mode, press the [I/⏻] button, and turn OFF the power. When "TOC" disappears, disconnect the power plug from the outlet.
   If the test mode cannot be exited, refer to "Forced Reset" on page 8.

Fig. 1 Reading the Test Mode Display (During recording and stop)

[RTs@@c##c**]
Fluorescent display tube display

@@ : Cause of retry
: Number of retries
** : Number of retry errors

Fig. 2 Reading the Test Mode Display (During playback)

[@@####**$$]
Fluorescent display tube display

@@ : Parts No. (name of area named on TOC)
: Cluster
** : Sector } Address (Physical address on disc)
$$: Track mode (Track information such as copyright information of each part)

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa-decimal	Cause of Retry	Occurring conditions
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock	When track jump (shock) is detected
	0	0	0	0	0	0	1	0	02	ader5	When ADER was counted more than five times continuously
	0	0	0	0	0	1	0	0	04	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	1	0	0	0	08	DIN unlock	When DIN unlock is detected
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	CLV unlock	When CLV is unlocked
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

Reading the Display:
Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example
When 42 is displayed:
Higher bit : 4 = 0100 ⟶ b6
Lower bit : 2 = 0010 ⟶ b1
In this case, the retry cause is combined of "CLV unlock" and "ader5".

When A2 is displayed:
Higher bit : A = 1010 ⟶ b7+b5
Lower bit : 2 = 0010 ⟶ b2
The retry cause in this case is combined of "access fault", "IVR rec error", and "ader5".

Reading the Track Mode Display

	Higher Bits				Lower Bits				Hexa-decimal	Details	
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0		When 0	When 1
Binary	0	0	0	0	0	0	0	1	01	Emphasis OFF	Emphasis ON
	0	0	0	0	0	0	1	0	02	Monaural	Stereo
	0	0	0	0	0	1	0	0	04	This is 2-bit display. Normally 01.	
	0	0	0	0	1	0	0	0	08	01:Normal audio. Others:Invalid	
	0	0	0	1	0	0	0	0	10	Audio (Normal)	Invalid
	0	0	1	0	0	0	0	0	20	Original	Digital copy
	0	1	0	0	0	0	0	0	40	Copyright	No copyright
	1	0	0	0	0	0	0	0	80	Write prohibited	Write allowed

Reading the Display:
Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example When 84 is displayed:
Higher bit : 8 = 1000 ⟶ b7
Lower bit : 4 = 0100 ⟶ b2
In this case, as b2 and b7 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis OFF”, “monaural”, “original”, “copyright exists”, and “write allowed”.

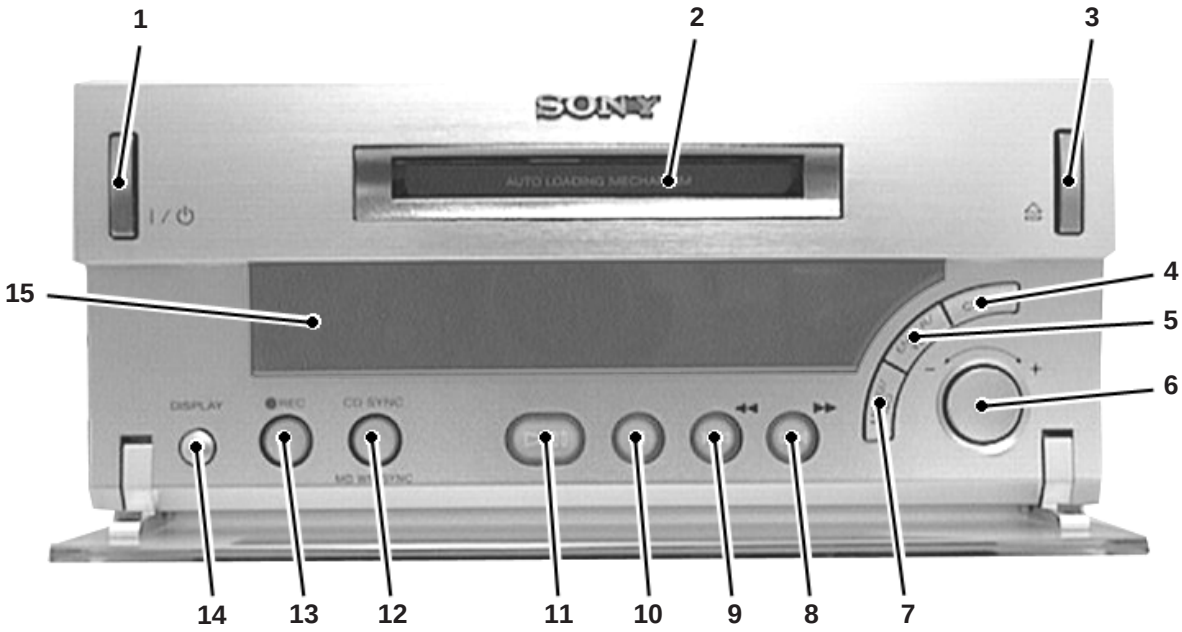
Example When 07 is displayed:
Higher bit : 0 = 1000 ⟶ All 0
Lower bit : 7 = 0111 ⟶ b0+b1+b2
In this case, as b0, b1, and b2 are 1 and others are 0, it can be determined that the retry cause is combined of “emphasis ON”, “stereo”, “original”, “copyright exists”, and “write prohibited”.

Hexadecimal ⟶ Binary Conversion Table

Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

SECTION 2
GENERAL

Front Panel



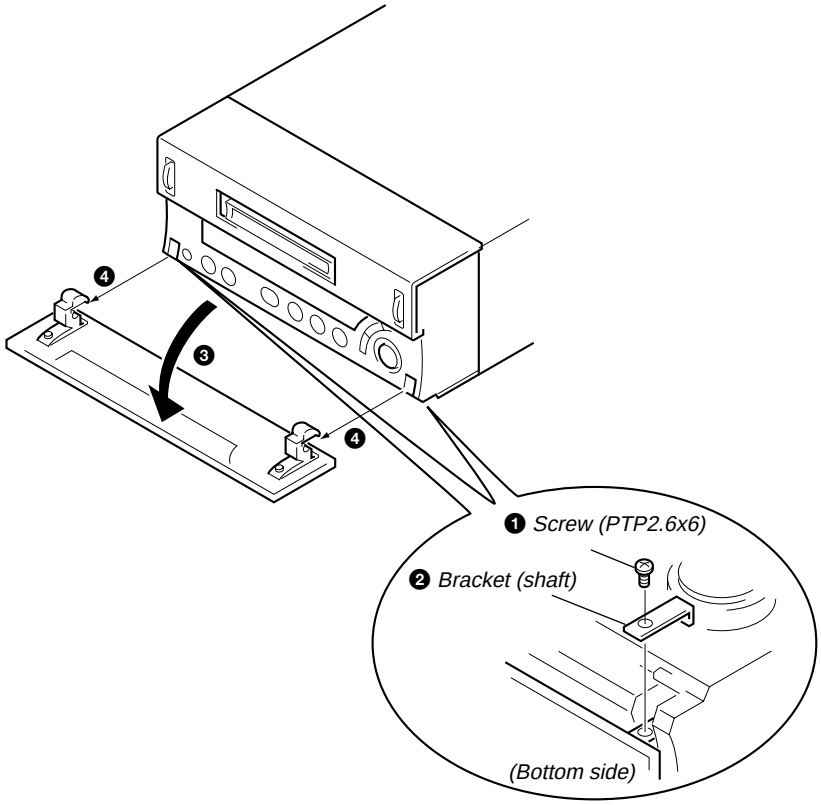
Location of Parts and Controls

1 I/⏻ (Power) button
2 MD disk compartment
3 ⏏ button
4 CLEAR button
5 ENTER/YES button
6 VOLUME knob
7 MENU/NO button
8 ⏭/▶▶ button
9 ⏮/◀◀ button
10 ☐ button
11 ▷/⏸ button
12 CD SYNC/MD WM SYNC button
13 ● REC button
14 DISPLAY button
15 Display window

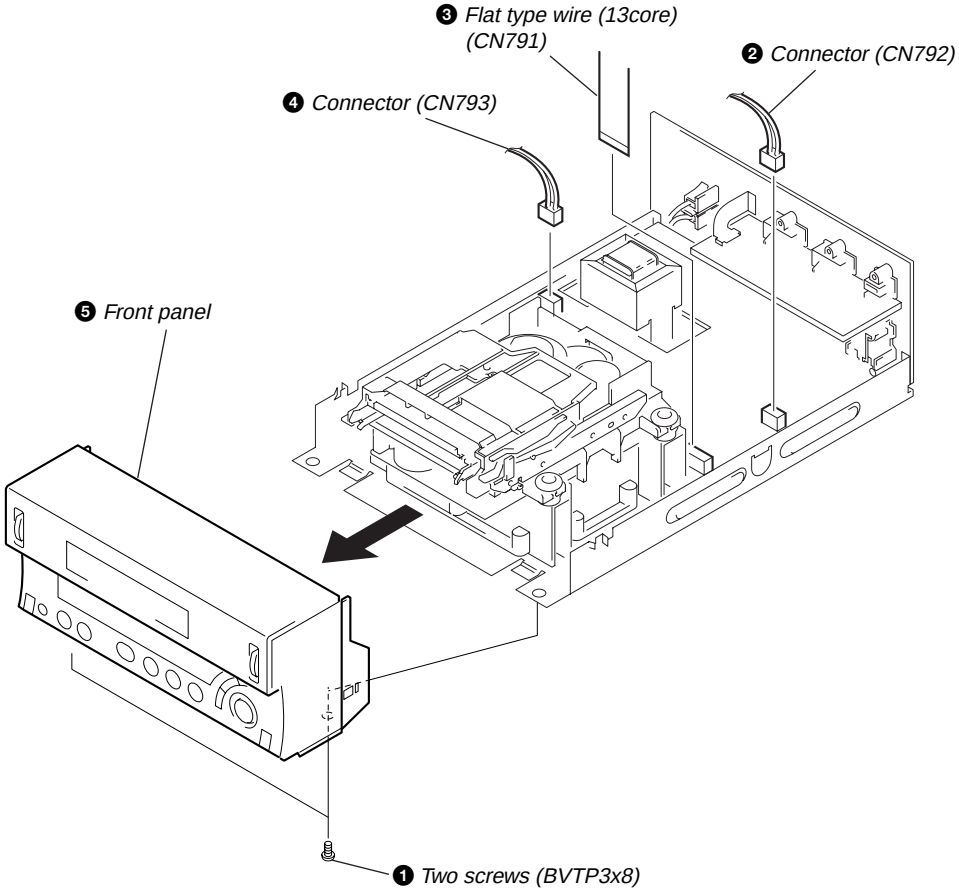
SECTION 3
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

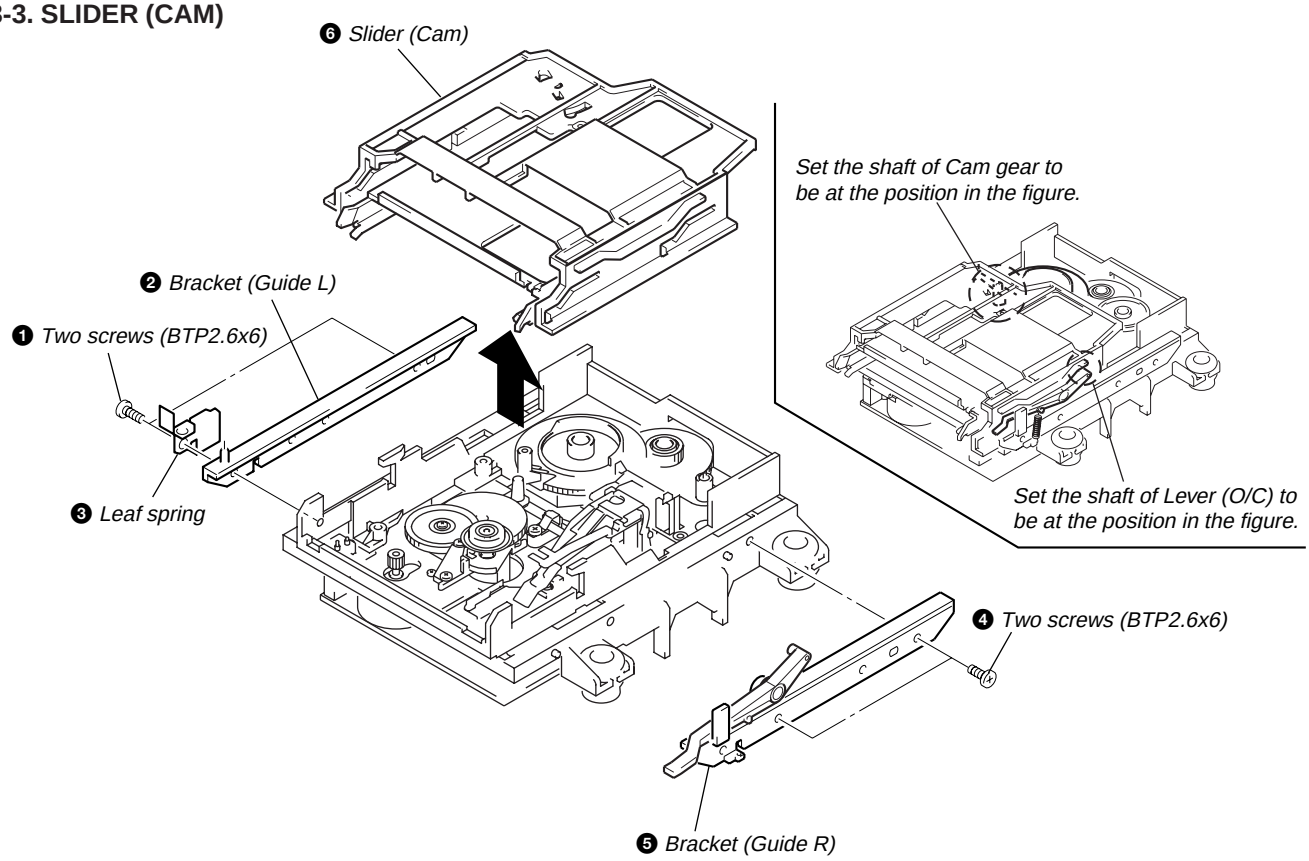
3-1. GLASS ASSY



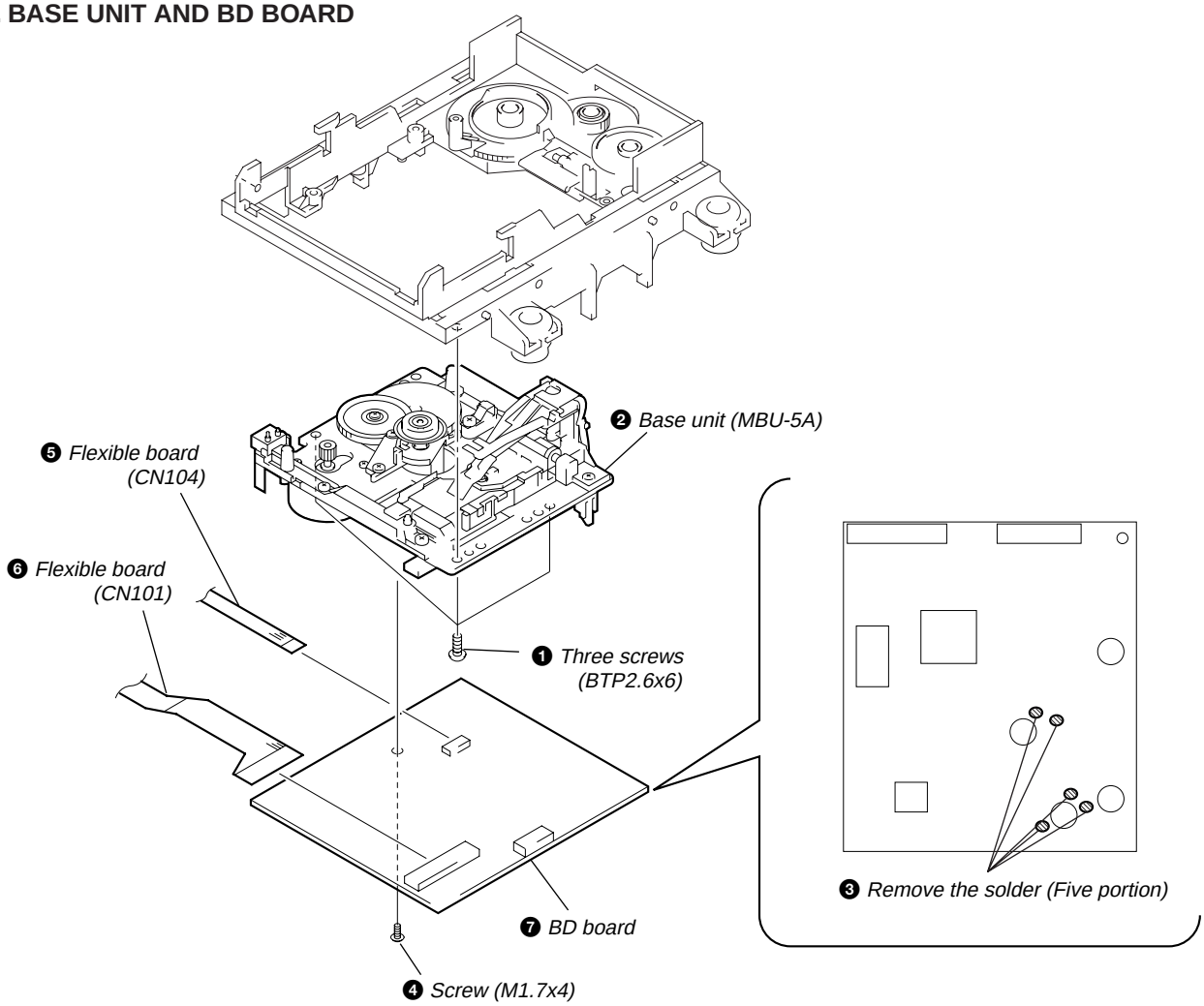
3-2. FRONT PANEL



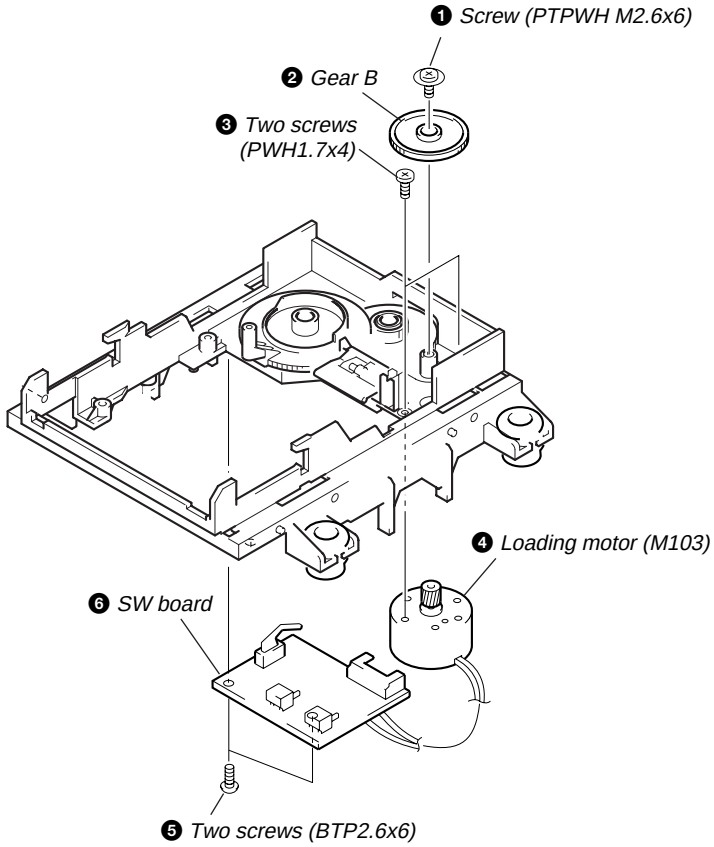
3-3. SLIDER (CAM)


❻ Slider (Cam)
Set the shaft of Cam gear to be at the position in the figure.
❷ Bracket (Guide L)
❶ Two screws (BTP2.6x6)
❸ Leaf spring
Set the shaft of Lever (O/C) to be at the position in the figure.
❹ Two screws (BTP2.6x6)
❺ Bracket (Guide R)

3-4. BASE UNIT AND BD BOARD


❷ Base unit (MBU-5A)
❺ Flexible board (CN104)
❻ Flexible board (CN101)
❶ Three screws (BTP2.6x6)
❸ Remove the solder (Five portion)
❼ BD board
❹ Screw (M1.7x4)

3-5. SW BOARD AND LOADING MOTOR (M103)



SECTION 4
TEST MODE

4-1. PRECAUTIONS FOR USE OF TEST MODE

- As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
  Even if the ⏏ button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
  Therefore, it will be ejected while rotating.
  Be sure to press the ⏏ button after pressing the MENU/NO button and the rotation of disc is stopped.

4-1-1. Recording laser emission mode and operating buttons

- Continuous recording mode (CREC MODE)
- Laser power check mode (LDPWR CHECK)
- Laser power adjustment mode (LDPWR ADJUST)
- Traverse (MO) check (EF MO CHECK)
- Traverse (MO) adjustment (EF MO ADJUST)
- When pressing the ●REC button.

4-2. SETTING THE TEST MODE

The following are two methods of entering the test mode.

Procedure 1: While pressing the ENTER/YES button and ☐ button, connect the power plug to an outlet, and release the ENTER/YES button and ☐ button.
When the test mode is set “TEMP CHECK” will be displayed. Press the MENU/NO button to display “Check”.
“[Check]” will be displayed. Rotating the – ⟷ + knob switches between the following four groups; ⋯ ⟷ Check ⟷ Adjust ⟷ Service ⟷ Develop ⟷ ⋯.

Procedure 2: While pressing the ENTER/YES button, connect the power plug to the outlet and release the ENTER/YES button.
When the test mode is set, “TEMP CHECK” will be displayed. By setting the test mode using this method, only the “Check” group of method 1 can be executed.

4-3. EXITING THE TEST MODE

Press the I/⏻ button in the mode other than “TEMP CHECK”. The disc is ejected when loaded, and “Standby” display blinks, and the STANDBY state is set.

4-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the – ⟷ + knob, ENTER/YES button, and MENU/NO button.
The functions of these buttons are as follows.

Function name	Function
– ⟷ + knob	Changes parameters and modes
ENTER/YES button	Proceeds onto the next step. Finalizes input.
MENU/NO button	Returns to previous step. Stops operations.

4-5. SELECTING THE TEST MODE

There are 31 types of test modes as shown below. The groups can be switched by rotating the [– ⟷ +] knob. After selecting the group to be used, press the [ENTER/YES] button. After setting a certain group, rotating the [– ⟷ +] knob switches between these modes.
Refer to “Group” in the table for details selected.
All items used for servicing can be treated using group S. So be carefully not to enter other groups by mistake.

Display	Contents	Mark	Group (✻)
TEMP CHECK	Temperature compensation offset check		C S
LDPWR CHECK	Laser power check		C S
EF MO CHECK	Traverse (MO) check		C S
EF CD CHECK	Traverse (CD) check		C S
FBIAS CHECK	Focus bias check		C S
S curve CHECK	S letter check	(X)	C
VERIFY MODE	Non-volatile memory check	(X)	C
DETRK CHECK	Detrack check	(X)	C
TEMP ADJUST	Temperature compensation offset adjustment		A S
LDPWR ADJUST	Laser power adjustment		A S
EF MO ADJUST	Traverse (MO) adjustment		A S
EF CD ADJUST	Traverse (CD) adjustment		A S
FBIAS ADJUST	Focus bias adjustment		A S
EEP MODE	Non-volatile memory control	(X) (!)	D
MANUAL CMD	Command transmission	(X)	D
SVDATA READ	Status display	(X)	D
ERR DP MODE	Error history display, clear		S
SLES MOVE	Sled check	(X)	D
ACCESS MODE	Access check	(X)	D
0920 CHECK	Outermost circumference check	(X)	D
HEAD ADJUST	Head position check	(X)	D
CPLAY2 MODE	Same functions as CPLAY MODE	(X)	D
CREC2 MODE	Same functions as CREC MODE	(X)	D
ADJ CLEAR	Initialization of non-volatile memory of adjustment value		A S
AG Set (MO)	Auto gain output level adjustment (MO)		A S
AG Set (CD)	Auto gain output level adjustment (CD)		A S
Iop Read	IOP data display		C S
Iop Write	IOP data write		A S
INFOMATION	Microprocessing version display		C S
CPLAY MODE	Continuous play mode		C A S D
CREC MODE	Continuous recording mode		C A S D

Group (✻)
C: Check A: Adjust
S: Service D: Develop

- For details of each adjustment mode, refer to “5. Electrical Adjustments”.
  For details of “ERR DP MODE”, refer to “Self-Diagnosis Function” on page 2.
- If a different mode has been selected by mistake, press the [MENU/NO] button to exit that mode.
- Modes with (X) in the Mark column are not used for servicing and therefore are not described in detail. If these modes are set accidentally, press the [MENU/NO] button to exit the mode immediately. Be especially careful not to set the modes with (!) as they will overwrite the non-volatile memory and reset it, and as a result, the unit will not operate normally.

4-5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
   ① Set the disc in the unit. (Whichever recordable discs or discs for playback only are available.)
   ② Rotate the [– ⟷ +] knob and display "CPLAY MODE".
   ③ Press the [ENTER/YES] button to change the display to "CPLAY MID".
   ④ When access completes, the display changes to "C1 = ▯▯▯▯ AD = ▯▯".
   Note : The numbers "▯" displayed show you error rates and ADER.
2. Changing the parts to be played back
   ① Press the [ENTER/YES] button during continuous playback to change the display as below.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY IN" ┐
   ↑ ┘
   When pressed another time, the parts to be played back can be moved.
   ② When access completes, the display changes to "C1 = ▯▯▯▯ AD = ▯▯".
   Note : The numbers "▯" displayed show you error rates and ADER.
3. Ending the continuous playback mode
   ① Press the [MENU/NO] button. The display will change to "CPLAY MODE".
   ② Press the [⏏] button to remove the disc.
   Note : The playback start addresses for IN, MID, and OUT are as follows.
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster

4-5-2. Operating the Continuous Recording Mode (Use only when performing self-recording/palyback check.)

1. Entering the continuous recording mode
   ① Set a recordable disc in the unit.
   ② Rotate the [– ⟷ +] knob and display "CREC MODE".
   ③ Press the [ENTER/YES] button to change the display to "CREC MID".
   ④ When access completes, the display changes to "CREC (▯▯▯▯" and **REC** lights up.
   Note : The numbers "▯" displayed shows you the recording position addresses.
2. Changing the parts to be recorded
   ① When the [ENTER/YES] button is pressed during continuous recording, the display changes as below.
   "CPLAY MID" → "CPLAY OUT" → "CPLAY IN" ┐
   ↑ ┘
   When pressed another time, the parts to be recorded can be changed. **REC** goes off.
   ② When access completes, the display changes to "CREC (▯▯▯▯)" and **REC** lights up.
   Note : The numbers "▯" displayed shows you the recording position addresses.
3. Ending the continuous recording mode
   ① Press the [MENU/NO] button. The display changes to "CREC MODE" and **REC** goes off.
   ② Press the [⏏] button to remove the disc.
   Note 1 : The recording start addresses for IN, MID, and OUT are as follows.
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster
   Note 2 : The [MENU/NO] button can be used to stop recording anytime.
   Note 3 : Do not perform continuous recording for long periods of time above 5 minutes.
   Note 4 : During continuous recording, be careful not to apply vibration.

4-5-3. Non-Volatile Memory Mode (EEP MODE)

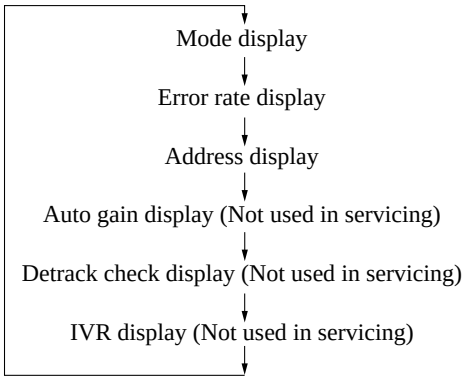
This mode reads and writes the contents of the non-volatile memory.
It is not used in servicing. If set accidentally, press the [MENU/NO] button immediately to exit it.

4-6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
▷	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
□	Stops continuous playback and continuous recording.
▶▶/▷▷|	The sled moves to the outer circumference only when this is pressed.
◀◀/|◁◁	The sled moves to the inner circumference only when this is pressed.
SCROLL	Switches between the pit and groove modes when pressed.
DISPLAY	Switches the displayed contents each time the button is pressed
⏏	Ejects the disc
I/⏻	Exits the test mode

4-7. TEST MODE DISPLAYS

Each time the DISPLAY button is pressed, the display changes in the following order.


Mode display
Error rate display
Address display
Auto gain display (Not used in servicing)
Detrack check display (Not used in servicing)
IVR display (Not used in servicing)

1. Mode display

Displays “TEMP ADJUST”, “CPLAYMODE”, etc.

2. Error rate display

Displays the error rate in the following way.

C1 = □□□□ AD = □□

C1 = Indicates the C1 error.

AD = Indicates ADER.

3. Address display

The address is displayed as follows. (MO:recordable disc, CD:playback only disc)

Pressing the CLEAR button switches between the group display and bit display.

h = □□□□ s = □□□□ (MO pit and CD)

h = □□□□ a = □□□□ (MO groove)

h = Indicates the header address.

s = Indicates the SUBQ address.

a = Indicates the ADIP address.

Note: “–” is displayed when servo is not imposed.

4. Auto gain display (Not used in servicing)

The auto gain is displayed as follows.

AG = □□ / □□ [□□]

5. Detrack check display (Not used in servicing)

The detrack is displayed as follows.

ADR = □□□□□□□

6. IVR display (Not used in servicing)

The IVR is displayed as follows.

[□□][□□][□□]

MEANINGS OF OTHER DISPLAYS

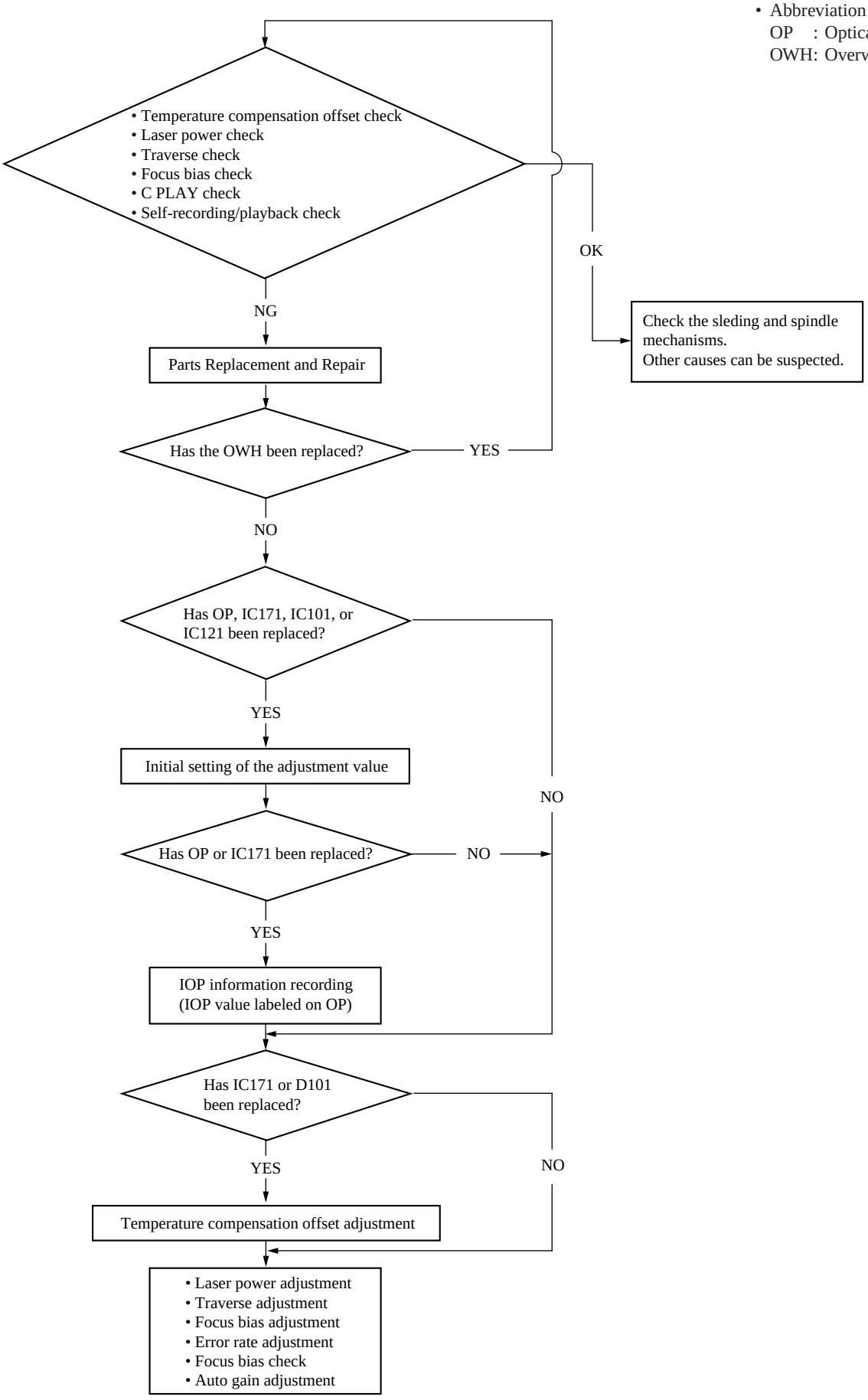
Display	Contents	
	When Lit	When Off
▷	During continuous playback (CLV: ON)	STOP (CLV: OFF)
▮▮	Tracking servo OFF	Tracking servo ON
SYNC	CLV low speed mode	CLV normal mode
LEVEL-SYNC	ABCD adjustment completed	
OVER	Tracking offset cancel ON	Tracking offset cancel OFF
REPEAT	Tracking auto gain OK	
1	Focus auto gain OK	
TRACK	Pit	Groove
DISC	High reflection	Low reflection
DATE	CLV-S	CLV-A
MONO	CLV LOCK	CLV UNLOCK

SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. PARTS REPLACEMENT AND ADJUSTMENT

• Check and adjust the MDM and MBU as follows.
The procedure changes according to the part replaced

• Abbreviation
OP : Optical pick-up
OWH: Overwrite head

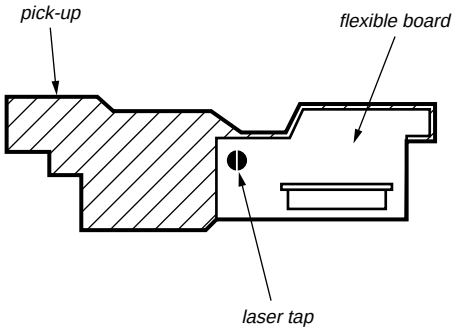


5-2. PRECAUTIONS FOR CHECKING LASER DIODE EMISSINON

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

5-3. PRECAUTIONS FOR USE OF OPTICAL PICK-UP (KMS-260A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



Optical pick-up flexible board

5-4. PRECAUTIONS FOR ADJUSTMENTS

1) When replacing the following parts, perform the adjustments and checks with **O** in the order shown in the following table.

	Optical Pick-up	BD Board			
		IC171	D101	IC101, IC121	IC192
1. Initial setting of adjustment value	O	O	×	O	×
2. Recording of IOP information (Value written in the pick-up)	O	O	×	×	×
3. Temperature compensation offset adjustment	×	O	O	×	×
4. Laser power adjustment	O	O	×	O	O
5. Traverse adjustment	O	O	×	O	×
6. Focus bias adjustment	O	O	×	O	×
7. Error rate check	O	O	×	O	×
8. Auto gain output level adjustment	O	O	×	O	×

2) Set the test mode when performing adjustments.
   After completing the adjustments, exit the test mode.
   Perform the adjustments and checks in "group S" of the test mode.
3) Perform the adjustments to be needed in the order shown.
4) Use the following tools and measuring devices.
   - Check Disc (MD) TDYS-1
     (Parts No. 4-963-646-01)
   - Test Disk (MDW-74/AU-1) (Parts No. 8-892-341-41)
   - Laser power meter LPM-8001 (Parts No. J-2501-046-A)

   or

     MD Laser power meter 8010S (Parts No. J-2501-145-A) (NOTE:)
   - Oscilloscope (Measure after performing CAL of prove.)
   - Digital voltmeter
   - Thermometer
   - Jig for checking BD board waveform
     (Parts No. : J-2501-149-A)
5) When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope.
   (VC and ground will become short-circuited.)
6) Using the above jig enables the waveform to be checked without the need to solder.
   (Refer to Servicing Note on page 6.)
7) As the disc used will affect the adjustment results, make sure that no dusts nor fingerprints are attached to it.

Note:
When performing laser power checks and adjustment (electrical adjustment), use of the new MD laser power meter 8010S (J-2501-145-A) instead of the conventional laser power meter is convenient. It sharply reduces the time and trouble to set the laser power meter sensor onto the objective lens of the pick-up.

5-5. CREATING CONTINUOUSLY RECORDED DISC

* This disc is used in focus bias adjustment and error rate check.
The following describes how to create a continuous recording disc.

1. Insert a disc (blank disc) commercially available.
2. Rotate the [– ⟷ +] knob and display "CREC MODE".
3. Press the [ENTER/YES] button again to display "CREC MID". Display "CREC (0300)" and start to recording.
4. Complete recording within 5 minutes.
5. Press the [MENU/NO] button and stop recording .
6. Press the [⏏] button and remove the disc.

The above has been how to create a continuous recorded data for the focus bias adjustment and error rate check.

Note :
- Be careful not to apply vibration during continuous recording.

5-6. CHECKS PRIOR TO REPAIRS

These checks are performed before replacing parts according to "approximate specifications" to determine the faulty locations. For details, refer to "Checks Prior to Parts Replacement and Adjustments" (See page 8).

5-6-1. Temperature Compensation Offset Check

When performing adjustments, set the internal temperature and room temperature to 22 to 28 C.

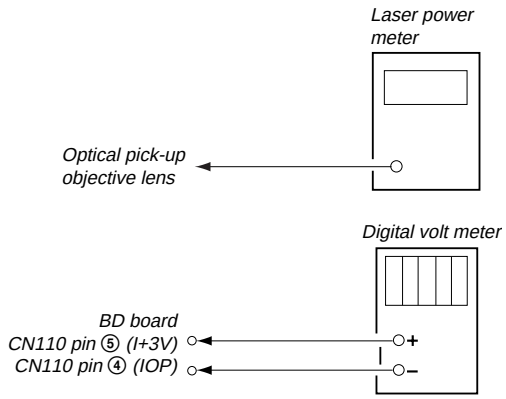
Checking Procedure:

1. Rotate the [– ⟷ +] knob to display "TEMP CHECK".
2. Press the [ENTER/YES] button.
3. "T=@@(##) [OK]" should be displayed. If "T=@@ (##) [NG]" is displayed, it means that the results are bad.
   (@@ indicates the current value set, and ## indicates the value written in the non-volatile memory.)

5-6-2. Laser Power Check

Before checking, check the IOP value of the optical pick-up. (Refer to 5-8. Recording and Displaying IOP Information.)

Connection :



Checking Procedure:

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀◀/⧏◁◁] button or [▶▶/▷▷⧐] button to move the optical pick-up.)
   Connect the digital volt meter to CN110 pin ⑤ (I+3V) and CN110 pin ④ (IOP).
2. Then, rotate the [– ⟷ +] knob and display "LDPWR CHECK".
3. Press the [ENTER/YES] button once and display "LD 0.9 mW $ ⬚⬚". Check that the reading of the laser power meter become 0.84 to 0.92 mW.
4. Press the [ENTER/YES] button once more and display "LD 7.0 mW $ ⬚⬚". Check that the reading the laser power meter and digital volt meter satisfy the specified value.

Specified Value :

Laser power meter reading : 7.0 ± 0.2 mW
Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

KMS260A
27X40
B0825

(For details of the method for checking this value, refer to "5-8. Recording and Displaying IOP Information".)

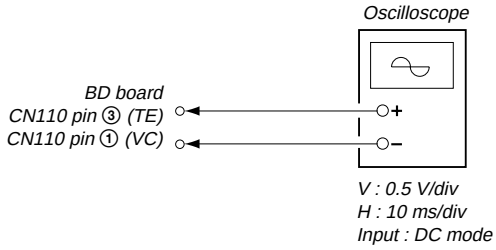
Iop = 82.5 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

5. Press the [MENU/NO] button and display "LDPWR CHECK" and stop the laser emission.
   (The [MENU/NO] button is effective at all times to stop the laser emission.)

Note 1: After step 4, each time the [ENTER/YES] button is pressed, the display will be switched between "LD 0.7 mW $ ⬚⬚", "LD 6.2 mW $ ⬚⬚", and "LD Wp ホセイ $ ⬚⬚". Nothing needs to be performed here.

5-6-3. Traverse Check

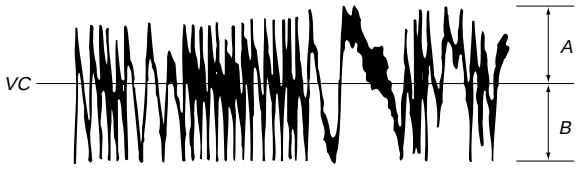
Connection :



Checking Procedure:

1. Connect an oscilloscope to CN110 pin ③ (TE) and CN110 pin ① (VC) of the BD board.
2. Load a disc (any available on the market). (Refer to Note 1.)
3. Press the [▶▶/▷▷⧐] button and move the optical pick-up outside the pit.
4. Rotate the [– ⟷ +] knob and display "EF MO CHECK".
5. Press the [ENTER/YES] button and display "EFB = ⬚ MO-R". (Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the [– ⟷ +] knob. (Read power traverse checking)

(Traverse Waveform)

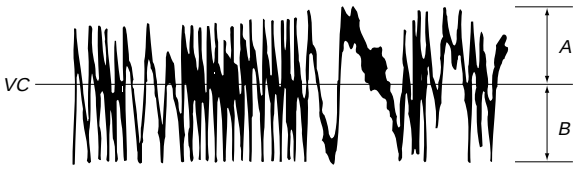


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2\,(A + B)} \times 100$$

7. Press the [ENTER/YES] button and display "EFB = ⬚ MO-W".
8. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the [– ⟷ +] knob. (Write power traverse checking)

(Traverse Waveform)



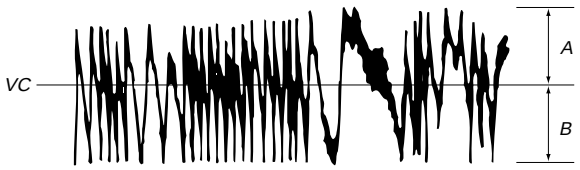
Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2\,(A + B)} \times 100$$

9. Press the [ENTER/YES] button display "EFB = ⬚ MO-P". Then, the optical pick-up moves to the pit area automatically and servo is imposed.

10. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the [– ⟷ +] knob.

(Traverse Waveform)

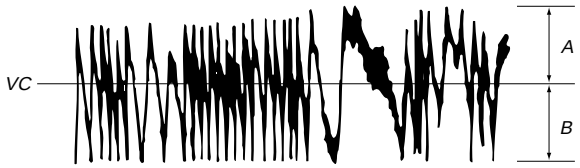


Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2\,(A + B)} \times 100$$

11. Press the [ENTER/YES] button display "EF MO CHECK" The disc stops rotating automatically.
12. Press the [⏏] button and remove the disc.
13. Load the check disc (MD) TDYS-1.
14. Roteto the [– ⟷ +] knob and display "EF CD CHECK".
15. Press the [ENTER/YES] button and display "EFB = □□ CD". Servo is imposed automatically.
16. Observe the waveform of the oscilloscope, and check that the specified value is satisfied. Do not rotate the [– ⟷ +] knob.

(Traverse Waveform)



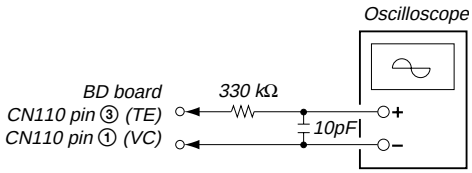
Specified value : Below 10% offset value

$$\text{Offset value (\%)} = \frac{|A - B|}{2\,(A + B)} \times 100$$

17. Press the [ENTER/YES] button and display "EF CD CHECK".
18. Press the [⏏] button and remove the check disc (MD) TDYS-1.

Note 1 : MO reading data will be erased during if a recorded disc is used in this adjustment.

Note 2 : If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



5-6-4. Focus Bias Check

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button twice and display "CPLAY MID".
4. Press the [MENU/NO] button when "C1 = □□□□ AD = □□" is displayed.
5. Rotate the [– ⟷ +] knob and display "FBIAS CHECK".
6. Press the [ENTER/YES] button and display " □□□□/□□ c = □□". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C1 error is below 220 and ADER is below 2.
7. Press the [ENTER/YES] button and display " □□□□/□□ b = □□". Check that the C1 error is below 220 and ADER is below 2.
8. Press the [ENTER/YES] button and display " □□□□/□□ a = □□". Check that the C1 error is below 220 and ADER is below 2.
9. Press the [MENU/NO] button, next press the [⏏] button, and remove the test disc.

5-6-5. C PLAY Checking

MO Error Rate Check

Checking Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. If the C1 error rate is below 80, check that ADER is below 2.
6. Press the [MENU/NO] button, stop playback, press the [⏏] button, and test disc.

CD Error Rate Check

Checking Procedure :

1. Load a check disc (MD) TDYS-1.
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button twice and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. Check that the C1 error rate is below 50.
6. Press the [MENU/NO] button, stop playback, press the [⏏] button, and the test disc.

5-6-6. Self-Recording/playback Check

Prepare a continuous recording disc using the unit to be repaired and check the error rate.

Checking Procedure :

1. Insert a recordable disc (blank disc) into the unit.
2. Rotate the [– ⟷ +] knob to display "CREC MODE".
3. Press the [ENTER/YES] button to display the "CREC MID".
4. When recording starts, " **REC** " is displayed, this becomes "CREC @@@@" (@@@@ is the address), and recording starts.
5. About 1 minute later, press the [MENU/NO] button to stop continuous recording.
6. Rotate the [– ⟷ +] knob to display "C PLAY MODE".
7. Press the [ENTER/YES] button to display "C PLAY MID".
8. "C1 = □□□□ AD = □□" will be displayed.
9. Check that the C1 error becomes below 80 and the AD error below 2.
10. Press the [MENU/NO] button to stop playback, and press the [⏏] button and remove the disc.

5-7. INITIAL SETTING OF ADJUSTMENT VALUE

Note:
Mode which sets the adjustment results recorded in the non-volatile memory to the initial setting value. However the results of the temperature compensation offset adjustment will not change to the initial setting value.
If initial setting is performed, perform all adjustments again excluding the temperature compensation offset adjustment.
For details of the initial setting, refer to "5-4. Precautions on Adjustments" and execute the initial setting before the adjustment as required.

Setting Procedure :
1. Rotate the [– ⟷ +] knob to display "ADJ CLEAR".
2. Press the [ENTER/YES] button. "Complete!" will be displayed momentarily and initial setting will be executed, after which "ADJ CLEAR" will be displayed.

5-8. RECORDING AND DISPLAYING THE IOP INFORMATION

The IOP data can be recorded in the non-volatile memory. The IOP value on the label of the optical pickup and the IOP value after the adjustment will be recorded. Recording these data eliminates the need to read the label on the optical pick-up.

Recording Procedure :
1. While pressing the [ENTER/YES] button and [☐] button, connect the power plug to the outlet, and release the [ENTER/YES] button and [☐] button.
2. "TEMP CHECK" will be displayed. Press the [MENU/NO] button to display "Check".
3. Rotate the [– ⟷ +] knob to display "[Service]", and press the [ENTER/YES] button.
4. Rotate the [– ⟷ +] knob to display "Iop.Write", and press the [ENTER/YES] button.
5. The display becomes Ref=@@@.@ (@ is an arbitrary number) and the numbers which can be changed will blink.
6. Input the IOP value written on the optical pick-up.
   To select the number : Rotate the [– ⟷ +] knob.
   To select the digit : Press the [CD SYNC/MD WM SYNC] button.
7. When the [ENTER/YES] button is pressed, the display becomes "Measu=@@@.@" (@ is an arbitrary number).
8. As the adjustment results are recorded for the step 7 value. Leave it as it is and press the [ENTER/YES] button.
9. "Complete!" will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become "Iop Write".

Display Procedure :
1. Rotate the [– ⟷ +] knob to display "Iop.Read".
2. "@@.@/##.#" is displayed and the recorded contents are displayed.
   @@.@ indicates the Iop value labeled on the pick-up.
   ##.# indicates the Iop value after adjustment
3. To end, press the [CD SYNC/MD WM SYNC] button. or [MENU/NO] button to display "Iop Read".

5-9. TEMPERATURE COMPENSATION OFFSET ADJUTMENT

Save the temperature data at that time in the non-volatile memory as 25 ˚C reference data.
Note :
1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 ˚C to 28 ˚C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature of 22 ˚C to 28 ˚C.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

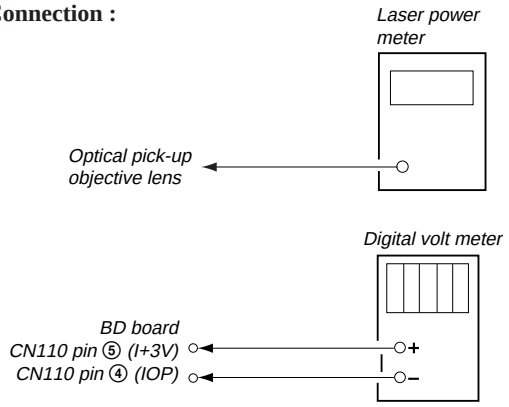
Adjusting Procedure :
1. Rotate the [– ⟷ +] knob and display "TEMP ADJUST".
2. Press the [ENTER/YES] button and select the "TEMP ADJUST" mode.
3. "TEMP = ▯▯ [OK]" and the current temperature data will be displayed.
4. To save the data, press the [ENTER/YES] button.
   When not saving the data, press the [MENU/NO] button.
5. When the [ENTER/YES] button is pressed, "TEMP = ▯▯ SAVE" will be displayed and turned back to "TEMP ADJUST" display then. When the [MENU/NO] button is pressed, "TEMP ADJUST" will be displayed immediatelly.

Specified Value :
The "TEMP = ▯▯" should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

5-10. LASER POWER ADJUSTMENT

Check the IOP value of the optical pick-up before adjustments. (Refer to 5-8. Recording and Displaying IOP Information.)

Connection :



Adjusting Procedure :
1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the [◀◀/⏮◁◁] button or [▶▶/▷▷⏭] button to move the optical pick-up.)
   Connect the digital volt meter to CN110 pin ⑤ (I+3V) and CN110 pin ④ (IOP).
2. Rotate the [– ⟷ +] knob and display "LDPWR ADJUST". (Laser power : For adjustment)
3. Press the [ENTER/YES] button once and display "LD 0.9 mW $ ▯▯".
4. Rotate the [– ⟷ +] knob so that the reading of the laser power meter becomes 0.85 to 0.91 mW. Press the [ENTER/YES] button after setting the range knob of the laser power meter, and save the adjustment results. ("LD SAVE $ ▯▯" will be displayed for a moment.)
5. Then "LD 7.0 mW $ ▯▯" will be displayed.
6. Rotate the [– ⟷ +] knob so that the reading of the laser power meter becomes 6.9 to 7.1 mW, press the [ENTER/YES] button and save it.

Note : Do not perform the emission with 7.0 mW more than 15 seconds continuously.

7. Then, rotate the [– ⟷ +] knob and display “LDPWR CHECK”.
8. Press the [ENTER/YES] button once and display “LD 0.9 mW $ □□”. Check that the reading of the laser power meter become 0.85 to 0.91 mW.
9. Press the [ENTER/YES] button once more and display “LD 7.0 mW $ □□”. Check that the reading the laser power meter and digital volt meter satisfy the specified value.
   Note down the digital voltmeter reading value.

Specified Value :

Laser power meter reading : 7.0 ± 0.1 mW
Digital voltmeter reading : Optical pick-up displayed value ± 10%

(Optical pick-up label)

KMS260A
27X40
B0825

(For details of the method for checking this value, refer to “5-8. Recording and Displaying IOP Information”.)

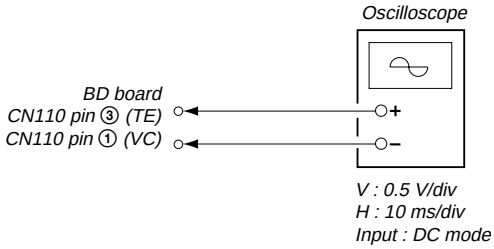
Iop = 82.5 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

10. Press the [MENU/NO] button and display “LDPWR CHECK” and stop the laser emission.
    (The [MENU/NO] button is effective at all times to stop the laser emission.)
11. Rotate the [– ⟷ +] knob to display “Iop.Write”.
12. Press the [ENTER/YES] button. When the display becomes Ref=@@@.@ (@ is an arbitrary number), press the [ENTER/YES] button to display “Measu=@@@.@” (@ is an arbitrary number).
13. The numbers which can be changed will blink. Input the Iop value noted down at step 9.
    To select the number : Rotate the [– ⟷ +] knob.
    To select the digit : Press the [CD SYNC/MD WM SYNC] button.
14. When the [ENTER/YES] button is pressed, “Complete!” will be displayed momentarily. The value will be recorded in the non-volatile memory and the display will become “Iop Write”.

Note 1: After step 4, each time the [ENTER/YES] button is pressed, the display will be switched between “LD 0.7 mW $ □□”, “LD 6.2 mW $ □□”, and “LD Wp ホセイ $ □□”. Nothing needs to be performed here.

5-11. TRAVERSE ADJUSTMENT

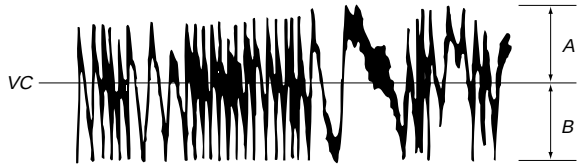
Connection :



Adjusting Procedure :

1. Connect an oscilloscope to CN110 pin ③ (TE) and CN110 pin ① (VC) of the BD board.
2. Load a disc (any available on the market). (Refer to Note 1.)
3. Press the [▶▶/▷▷‖] button and move the optical pick-up outside the pit.
4. Rotate the [– ⟷ +] knob and display “EF MO ADJUST”.
5. Press the [ENTER/YES] button and display “EFB = □□ MO-R”. (Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Rotate the [– ⟷ +] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [– ⟷ +] knob is rotated, the □□ of “EFB= □□” changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
   (Read power traverse adjustment)

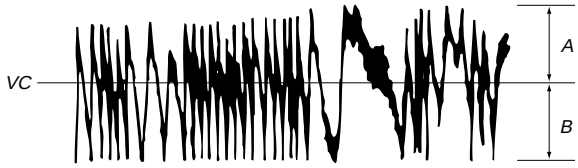
(Traverse Waveform)



Specification A = B

7. Press the [ENTER/YES] button and save the result of adjustment to the non-volatile memory (“EFB = □□ SAVE” will be displayed for a moment. Then “EFB = □□ MO-W” will be displayed).
8. Rotate the [– ⟷ +] knob so that the waveform of the oscilloscope becomes the specified value.
   (When the [– ⟷ +] knob is rotated, the □□ of “EFB- □□” changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
   (Write power traverse adjustment)

(Traverse Waveform)

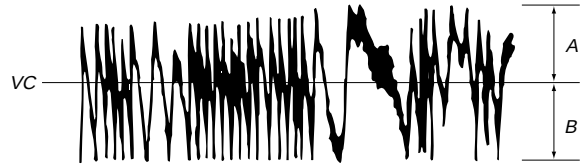


Specification A = B

9. Press the [ENTER/YES] button, and save the adjustment results in the non-volatile memory. (“EFB = □□ SAVE” will be displayed for a moment.)
10. “EFB = □□ MO-P”. will be displayed.
    The optical pick-up moves to the pit area automatically and servo is imposed.

11. Rotate the [– ⟷ +] knob until the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

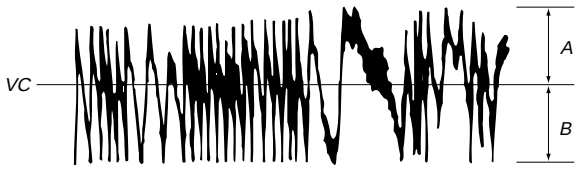
(Traverse Waveform)



Specification A = B

12. Press the [ENTER/YES] button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAVE" will be displayed for a moment.)
    Next "EF MO ADJUST" is displayed. The disc stops rotating automatically.
13. Press the [⏏] button and remove the disc.
14. Load the check disc (MD) TDYS-1.
15. Roteto [– ⟷ +] knob and display "EF CD ADJUST".
16. Press the [ENTER/YES] button and display "EFB = □□ CD". Servo is imposed automatically.
17. Rotate the [– ⟷ +] knob so that the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)

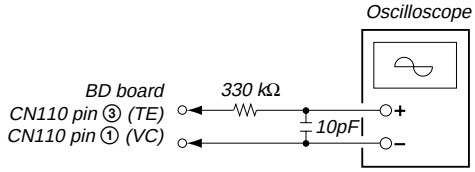


Specification A = B

18. Press the [ENTER/YES] button, display "EFB = □□ SAVE" for a moment and save the adjustment results in the non-volatile memory.
    Next "EF CD ADJUST" will be displayed.
19. Press the [⏏] button and remove the check disc (MD) TDYS-1.

Note 1 : MO reading data will be erased during if a recorded disc is used in this adjustment.

Note 2 : If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



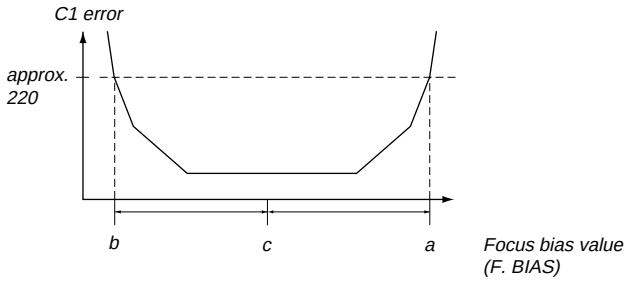
5-12. FOCUS BIAS ADJUSTMENT

Adjusting Procedure :

1. Load a test disk (MDW-74/AU-1).
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button and display "CPLAY MID".
4. Press the [MENU/NO] button when "C1 = □□□□ AD = □□" is displayed.
5. Rotate the [– ⟷ +] knob and display "FBIAS ADJUST".
6. Press the [ENTER/YES] button and display " □□□□/□□ a = □□". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
7. Rotate the [– ⟷ +] knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220 (Refer to Note 2).
8. Press the [ENTER/YES] button and display " □□□□/□□ b = □□".
9. Rotate the [– ⟷ +] knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes approximately 220.
    At this time, set the C1 error rate to about the same value set at step 7.
10. Press the [ENTER/YES] button and display " □□□□/□□ c = □□".
11. Check that the C1 error rate is below 50 and ADER is 00. Then press the [ENTER/YES] button.
12. If the "(□□)" in "□□ - □□ - □□ (□□)" is above 20, press the [ENTER/YES] button.
    If below 20, press the [MENU/NO] button and repeat the adjustment from step 2.
13. Press the [⏏] button to remove the test disc.

Note 1 : The relation between the C1 error and focus bias is as shown in the following figure. Find points a and b in the following figure using the above adjustment. The focal point position C is automatically calculated from points a and b.

Note 2 : As the C1 error rate changes, perform the adjustment using the average vale.



5-13. ERROR RATE CHECK

5-13-1. CD Error Rate Check

Checking Procedure :

1. Load a check disc (MD) TDYS-1.
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button twice and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. Check that the C1 error rate is below 20.
6. Press the [MENU/NO] button, stop playback, press the [⏏] button, and remove the test disc.

5-13-2. MO Error Rate Check

Checking Procedure :

1. Load a test disc (MDW-74/AU-1).
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the [MENU/NO] button, stop playback, press the [⏏] button, and remove the test disc.

5-14. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

Checking Procedure :

1. Load a test disc (MDW-74/AU-1).
2. Rotate the [– ⟷ +] knob and display "CPLAY MODE".
3. Press the [ENTER/YES] button twice and display "CPLAY MID".
4. Press the [MENU/NO] button when "C1 = □□□□ AD = □□" is displayed.
5. Rotate the [– ⟷ +] knob and display "FBIAS CHECK".
6. Press the [ENTER/YES] button and display " □□□□/□□ c = □□". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
   Check that the C1 error is below 50 and ADER is below 2.
7. Press the [ENTER/YES] button and display " □□□□/□□ b = □□". Check that the C1 error is below 220 and ADER is below 2.
8. Press the [ENTER/YES] button and display " □□□□/□□ a = □□". Check that the C1 error is below 220 and ADER is below 2
9. Press the [MENU/NO] button, next press the [⏏] button, and remove the continuously recorded disc.

Note 1 : If the C1 error and ADER are above other than the specified value at points a (step 8. in the above) or b (step 7. in the above), the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

5-15. AUTO GAIN CONTROL OUTPUT LEVEL ADJUSTMENT

Be sure to perform this adjustment when the pickup is replaced. If the adjustment results becomes "Adjust NG!", the pickup may be faulty or the servo system circuits may be abnormal.

5-15-1. CD Auto Gain Control Output Level Adjustment

Adjusting Procedure :

1. Insert the check disc (MD) TDYS-1.
2. Rotate the [– ⟷ +] knob to display "AG Set (CD)".
3. When the [ENTER/YES] button is pressed, the adjustment will be performed automatically.
   "Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (CD)".
4. Press the [⏏] button to remove the disc.

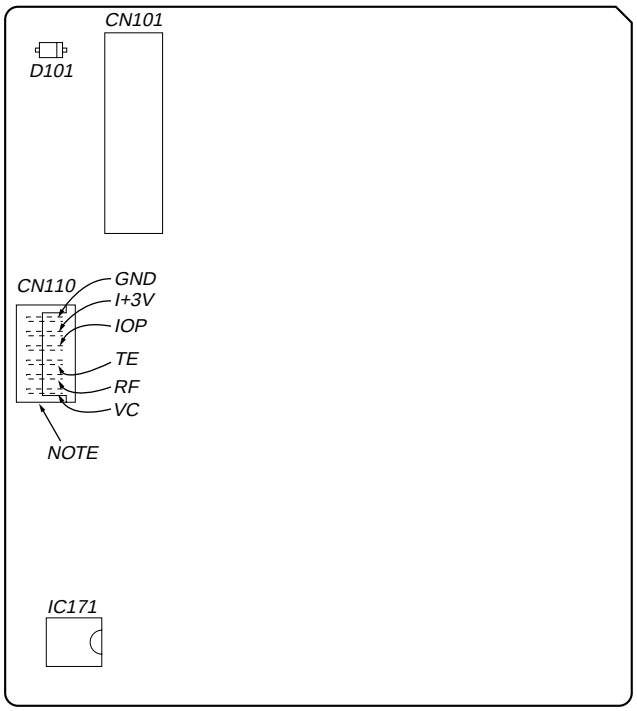
5-15-2. MO Auto Gain Control Output Level Adjustment

Adjusting Procedure :

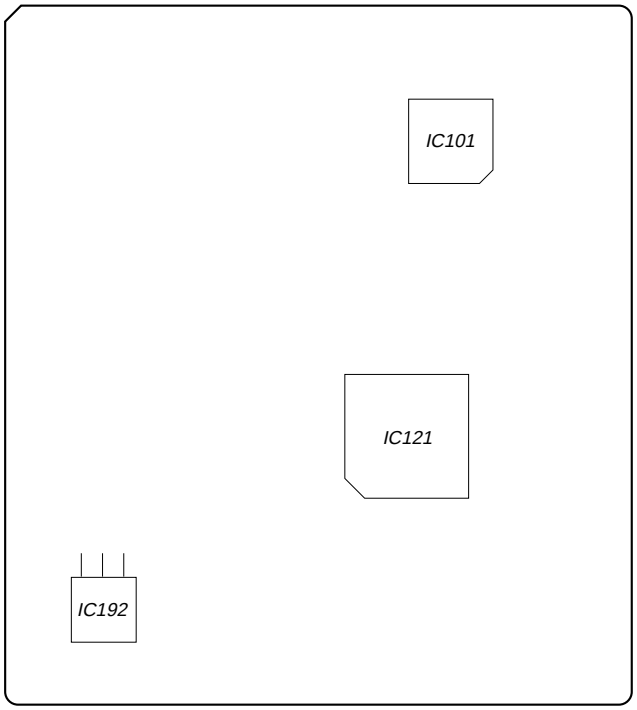
1. Insert the reference disc (MDW-74/AU-1) for recording.
2. Rotate the [– ⟷ +] knob to display "AG Set (MO)".
3. When the [ENTER/YES] button is pressed, the adjustment will be performed automatically.
   "Complete!!" will then be displayed momentarily when the value is recorded in the non-volatile memory, after which the display changes to "AG Set (MO)".
4. Press the [⏏] button to remove the disc.

5-15. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



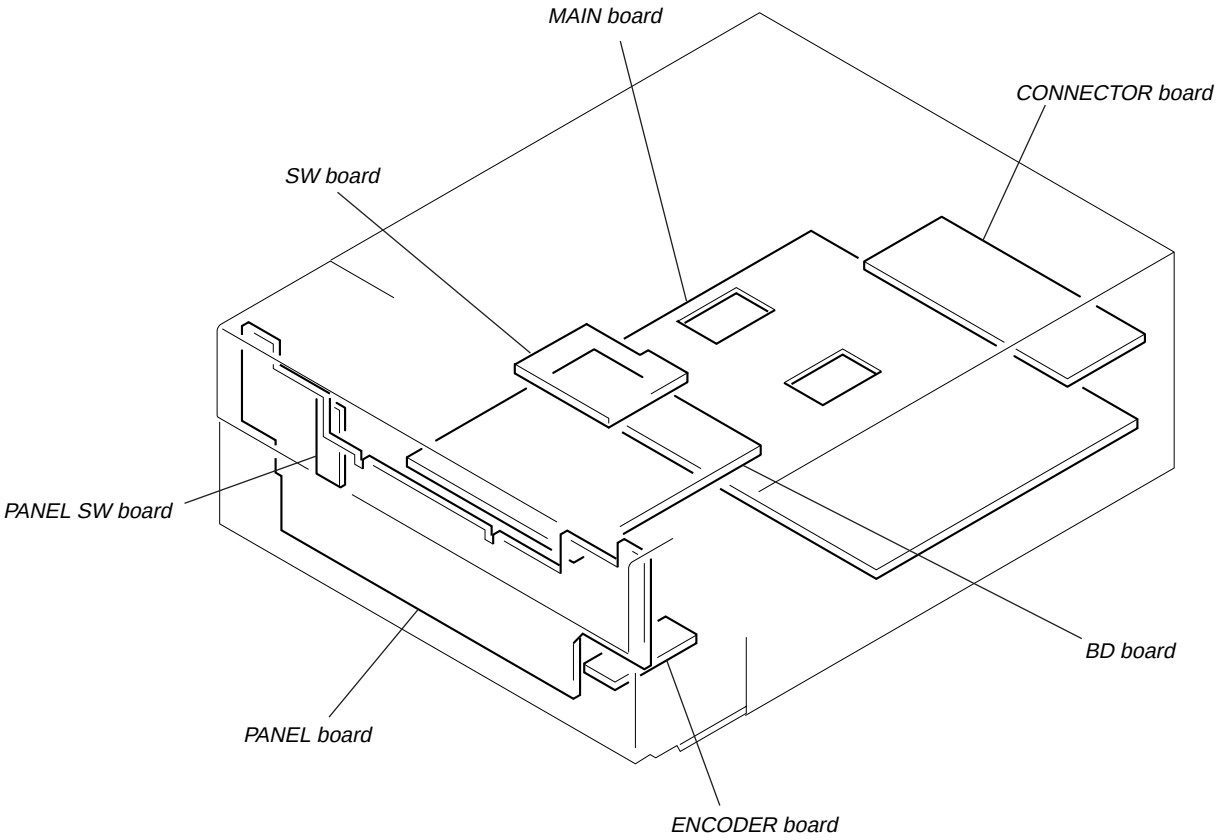
[BD BOARD] (SIDE B)



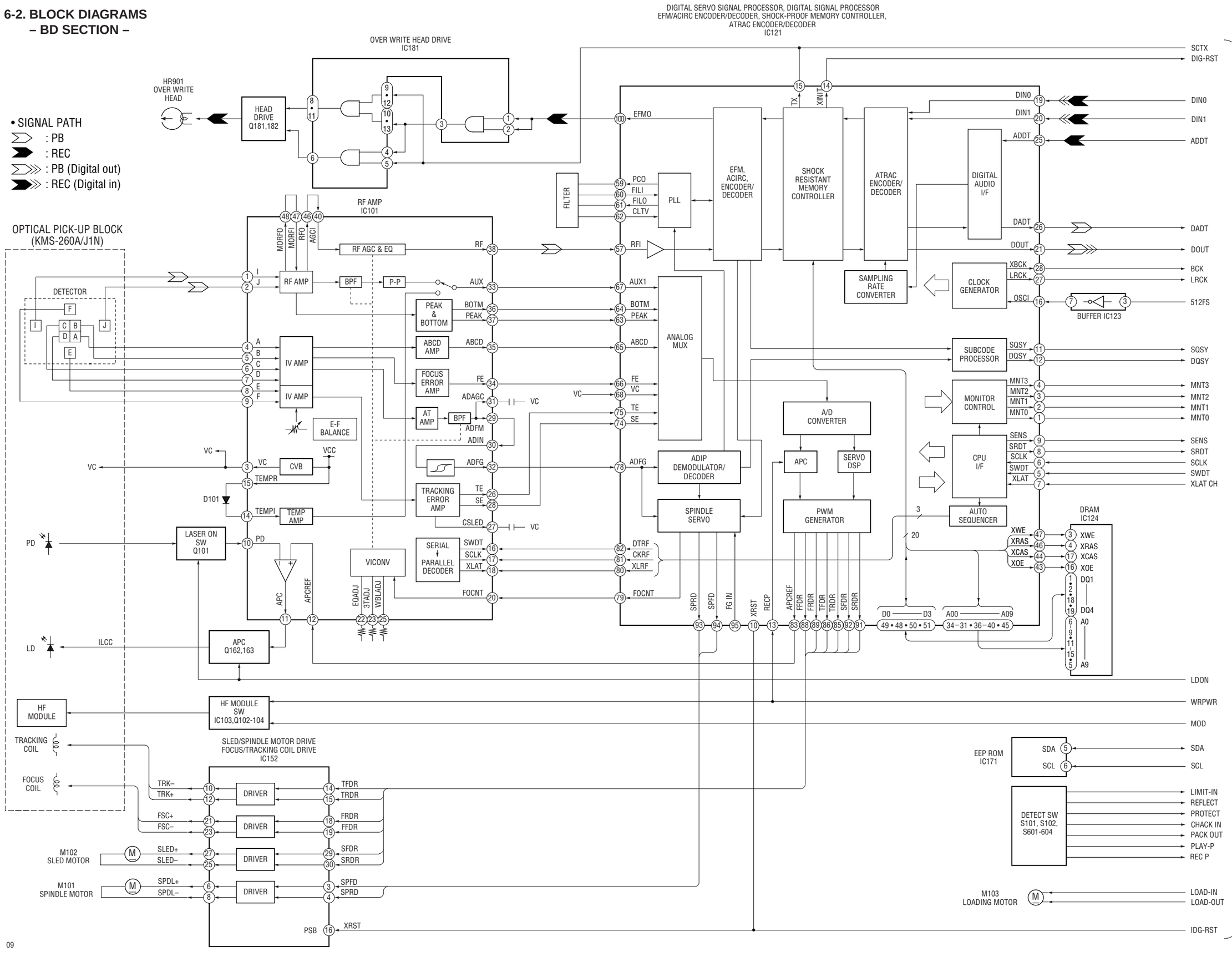
NOTE: It is useful to use the jig. for checking the waveform.
(Refer to Servicing Note on page 6.)

SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION

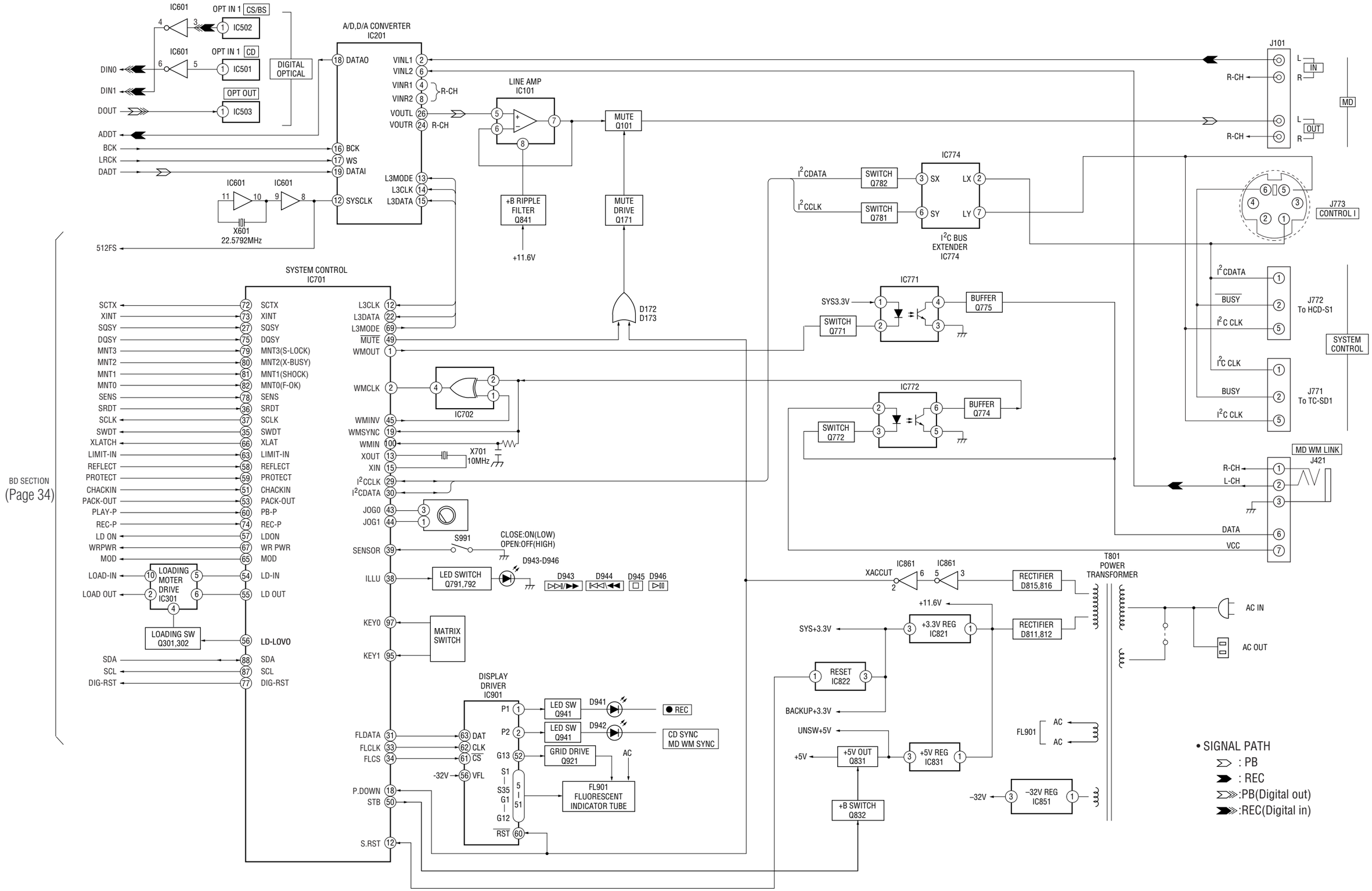


6-2. BLOCK DIAGRAMS
– BD SECTION –



09

– MAIN SECTION –



BD SECTION
(Page 34)

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS. (In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- C : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- U : B+ Line.
- V : B– Line.
- H : adjustment for repair.
- no mark : STOP
  ( ) : Play the test disc (TDYS-1)
  < > : REC
  ∗ : Can not be measured.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  E : PB
  q : REC
  a : PB (DIGITAL OUT)
  r : REC (DIGITAL IN)
- Abbreviation
  HK : Hong Kong model.
  SP : Singapore model.

For printed wiring boards.

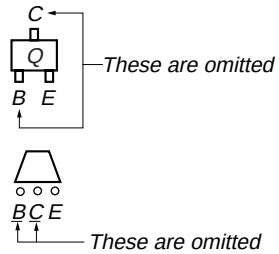
Note:

- X : parts extracted from the component side.
- Y : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- b : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

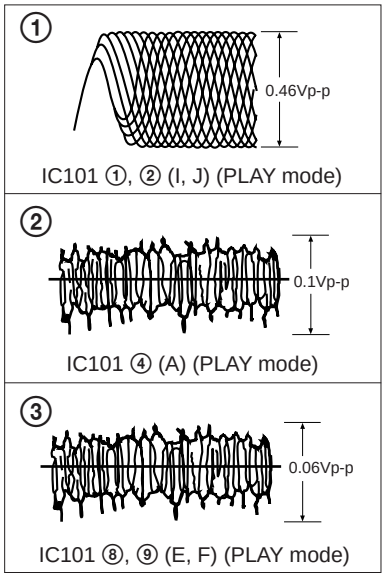
Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

• Indication of transistor



WAVEFORMS

– BD (1/2) SECTION –

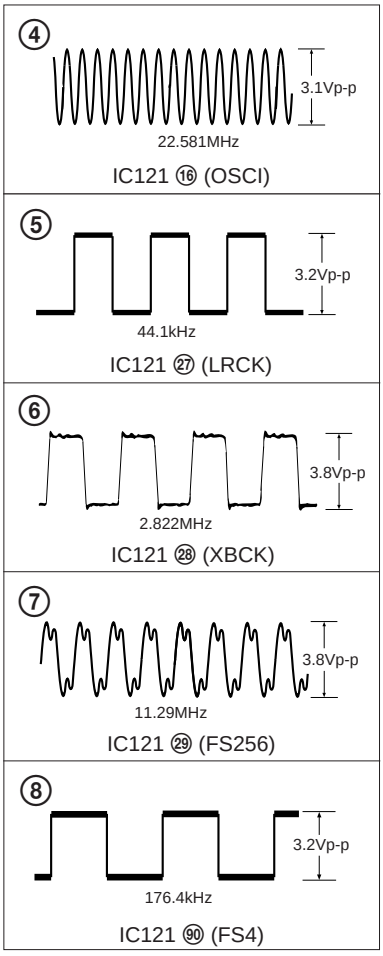


IC101 ①, ② (I, J) (PLAY mode)

IC101 ④ (A) (PLAY mode)

IC101 ⑧, ⑨ (E, F) (PLAY mode)

– BD (1/2) SECTION –



IC121 ⑯ (OSCI)

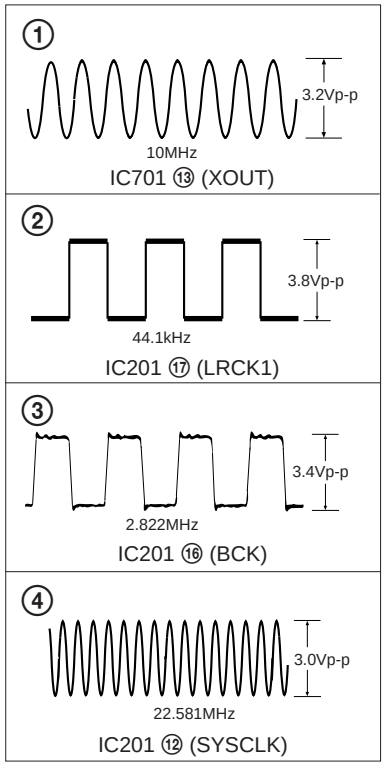
IC121 ㉗ (LRCK)

IC121 ㉘ (XBCK)

IC121 ㉙ (FS256)

IC121 ㉚ (FS4)

– MAIN SECTION –



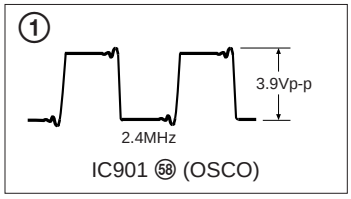
IC701 ⑬ (XOUT)

IC201 ⑰ (LRCK1)

IC201 ⑯ (BCK)

IC201 ⑫ (SYSCLK)

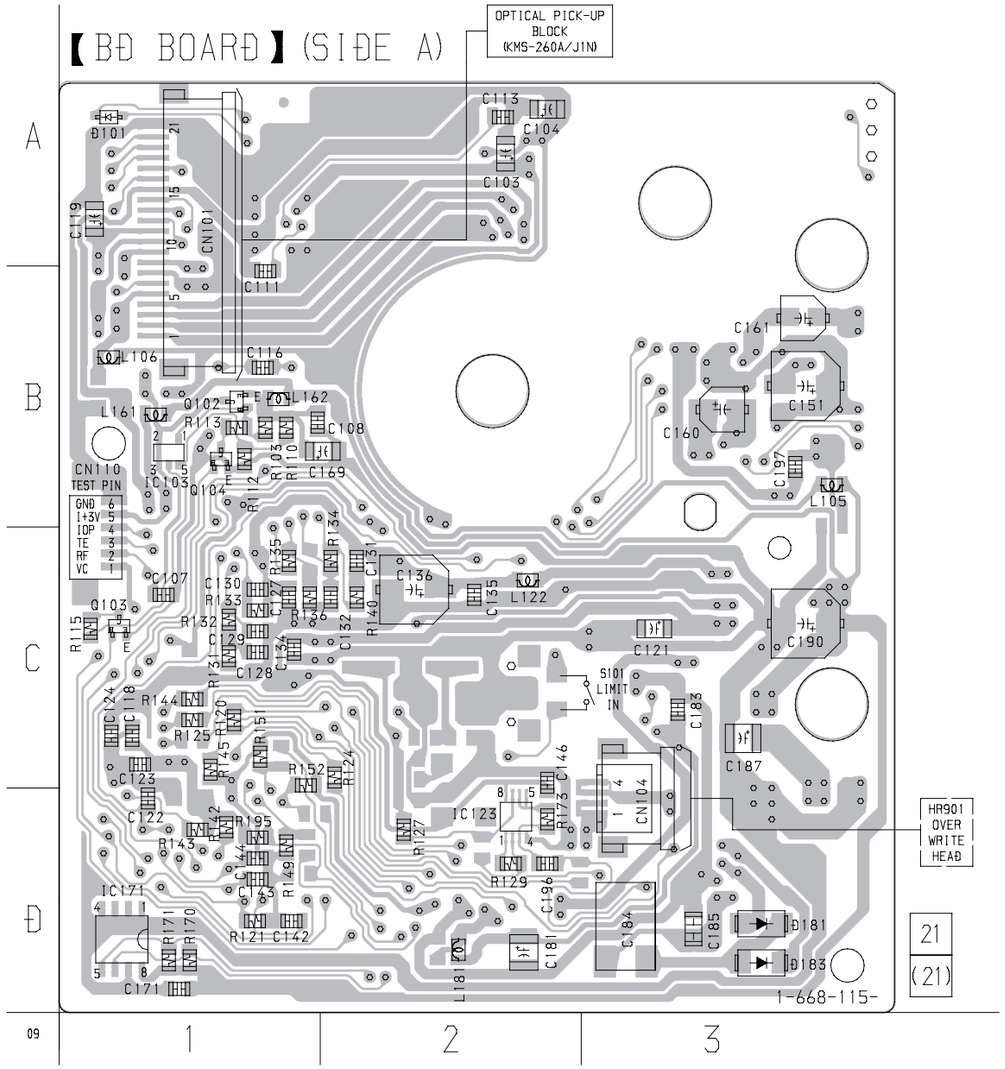
– DISPLAY SECTION –

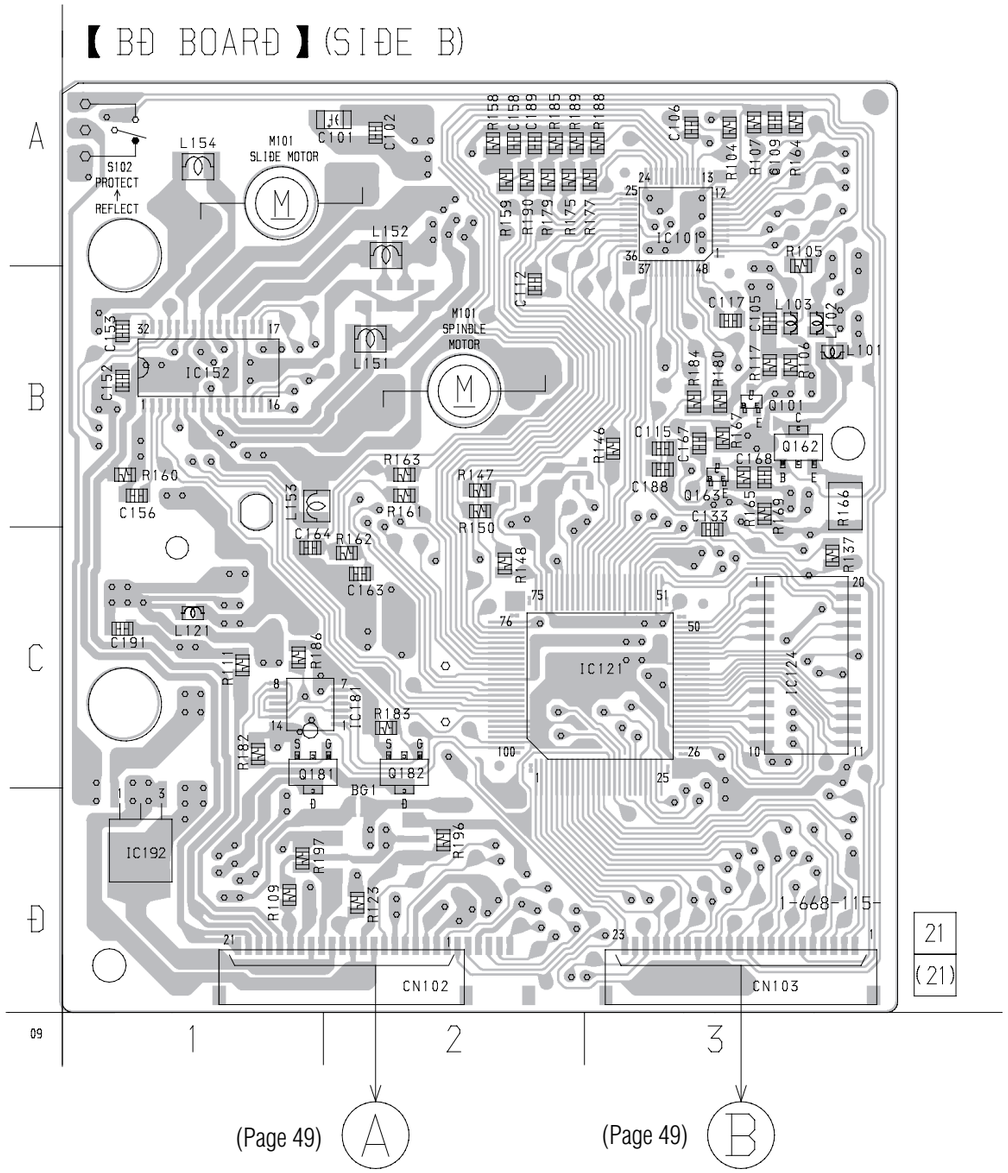


IC901 ㊽ (OSCO)

6-3. PRINTED WIRING BOARD – BD SECTION –

• See page 32 for Circuit Boards Location.





• **Semiconductor Location**

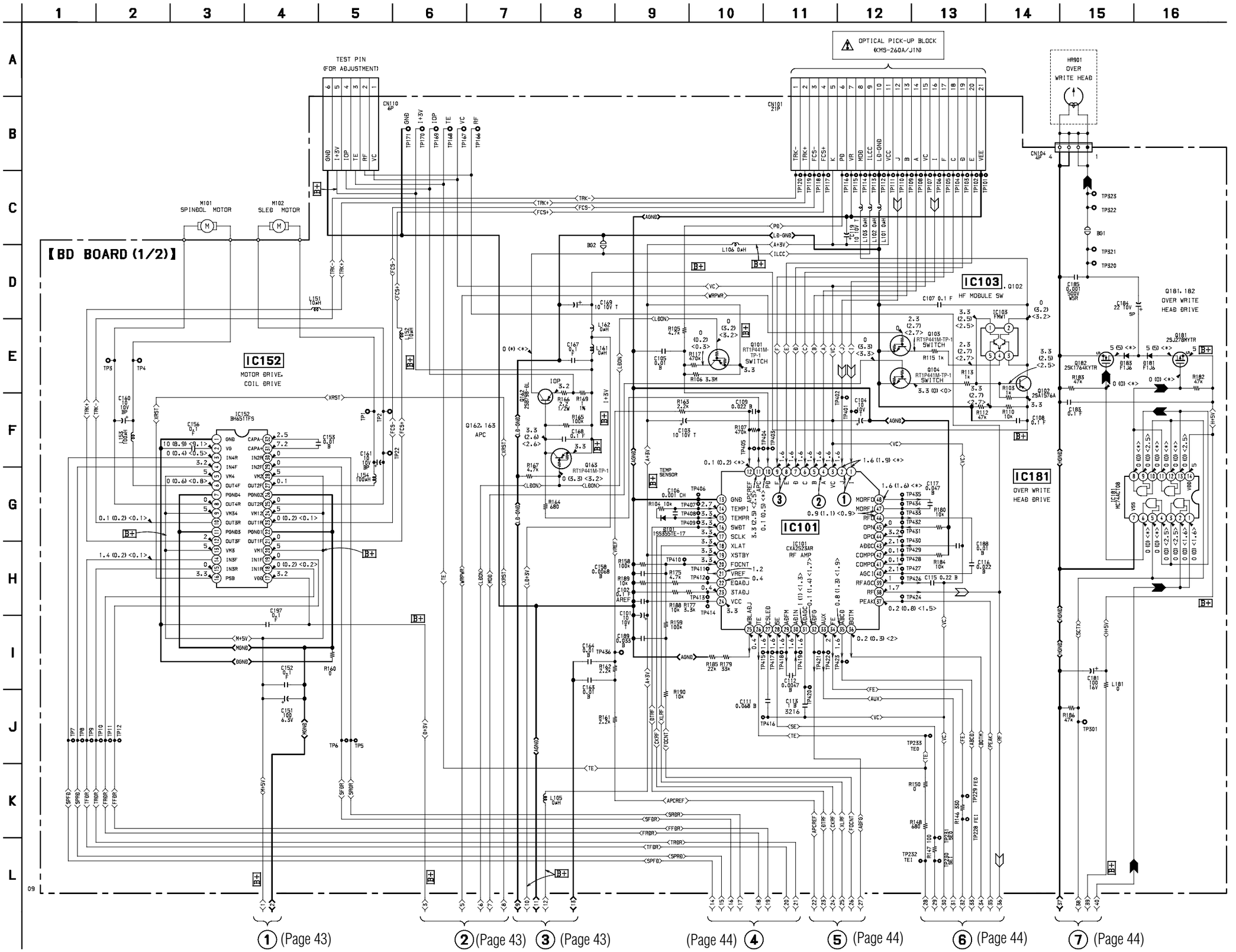
Ref. No.	Location
D101	A-1
D181	D-3
D183	D-3
IC103	B-1
IC123	D-2
IC171	D-1
Q102	B-1
Q103	B-1
Q104	B-1

• **Semiconductor Location**

Ref. No.	Location
IC101	A-3
IC121	C-3
IC124	C-3
IC152	B-1
IC181	C-1
IC192	D-1
Q101	B-3
Q162	B-3
Q163	B-3
Q181	C-1
Q182	C-2

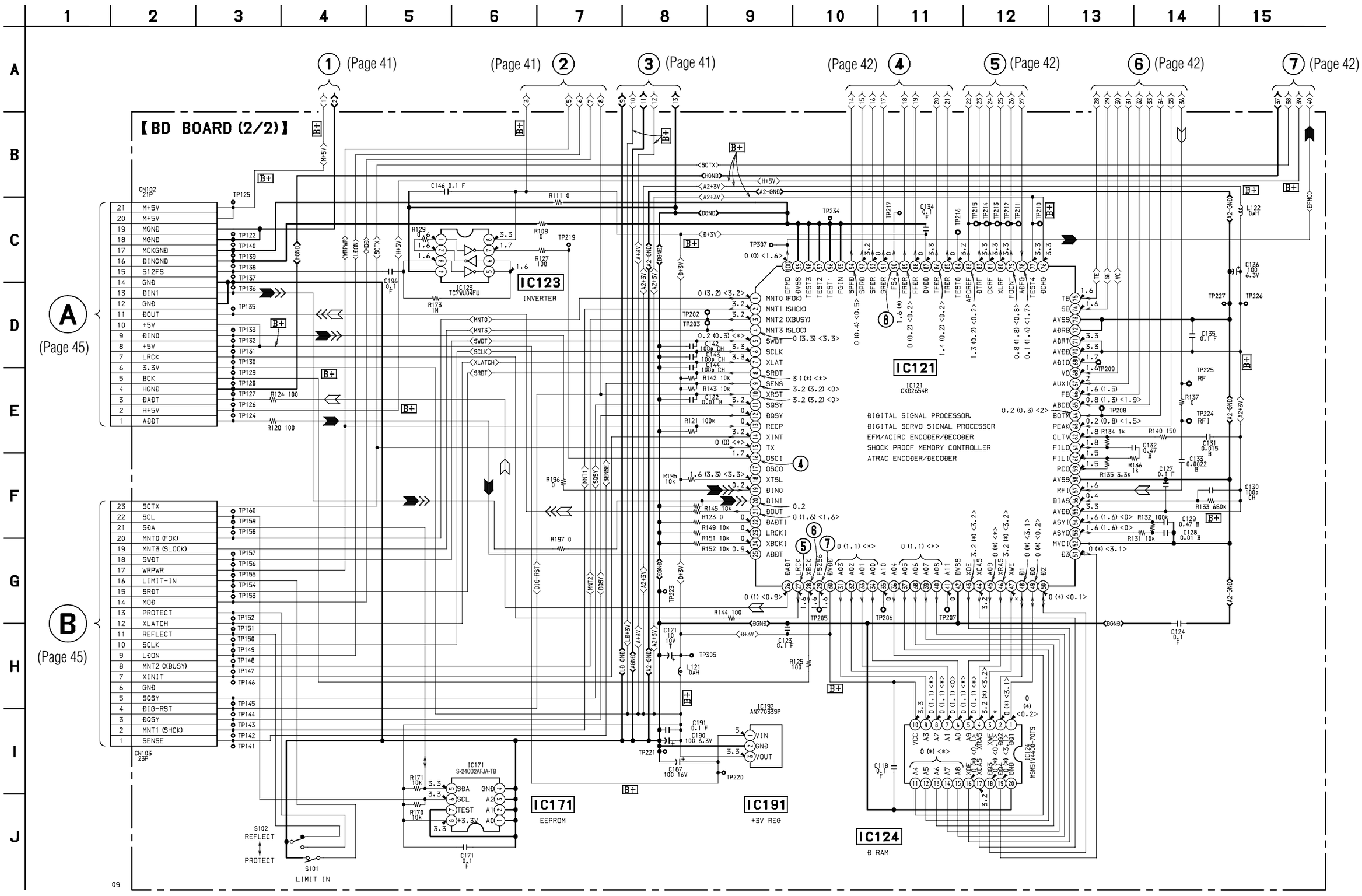
6-4. SCHEMATIC DIAGRAM – BD (1/2) SECTION –

- See page 38 for Waveforms.
- See page 61 for IC Block Diagrams.
- See page 64 for IC Pin Functions.



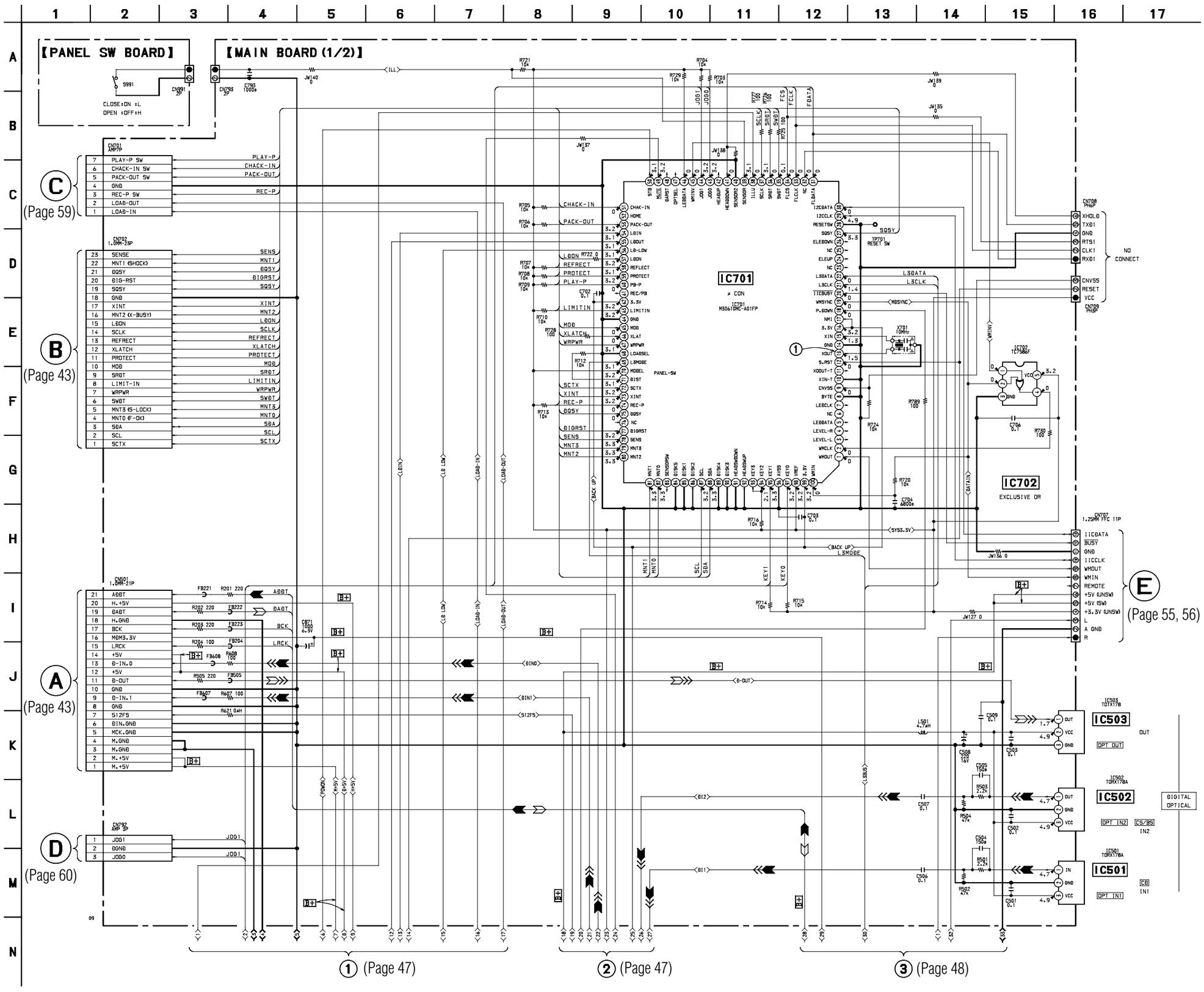
6-5. SCHEMATIC DIAGRAM – BD (2/2) SECTION –

- See page 38 for Waveforms.
- See page 39 for Printed Wiring Board.



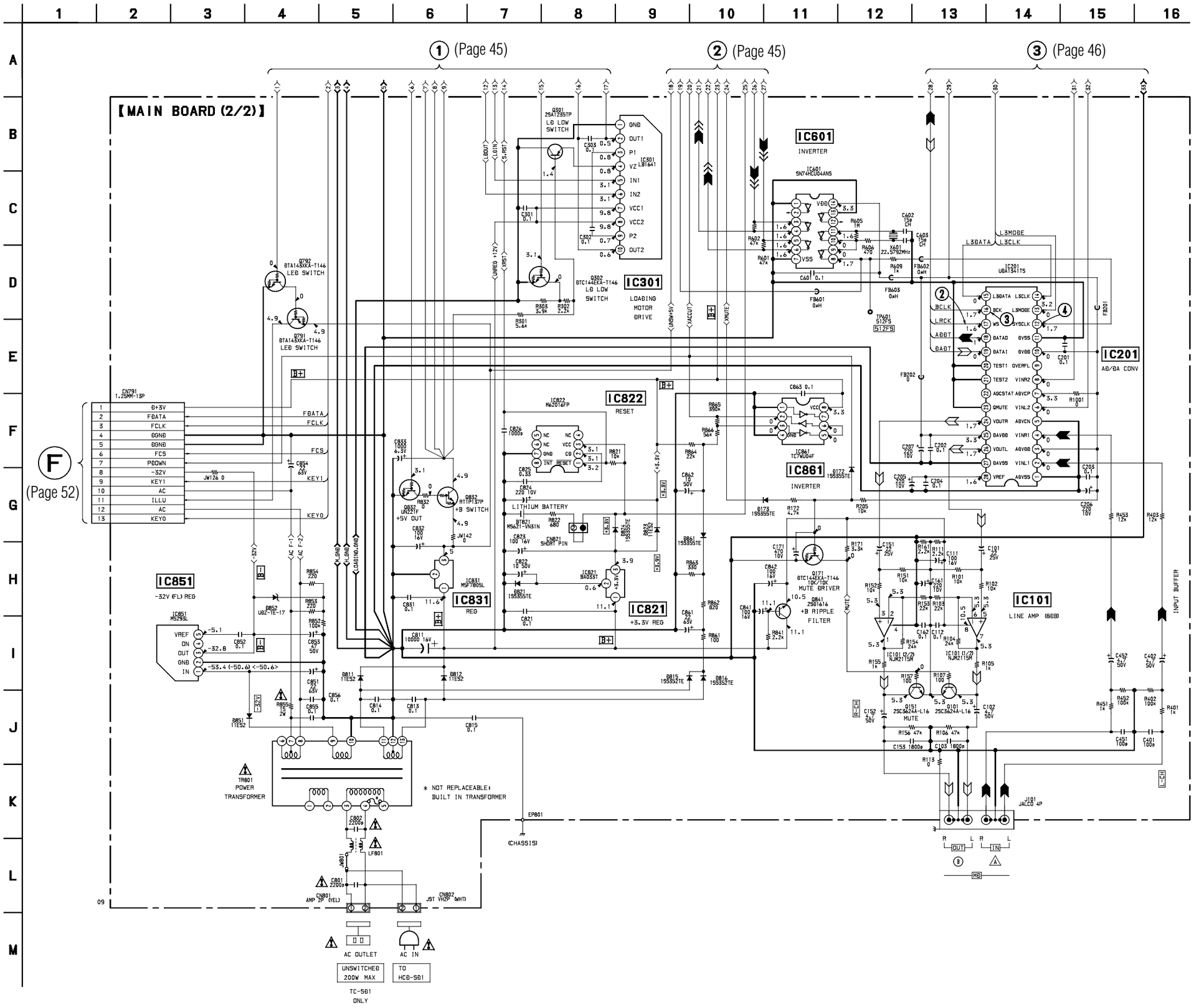
6-6. SCHEMATIC DIAGRAM – MAIN (1/2) SECTION –

- **See page 38 for Waveforms.**
- **See page 49 for Printed Wiring Board.**
- **See page 65 for IC Pin Functions.**



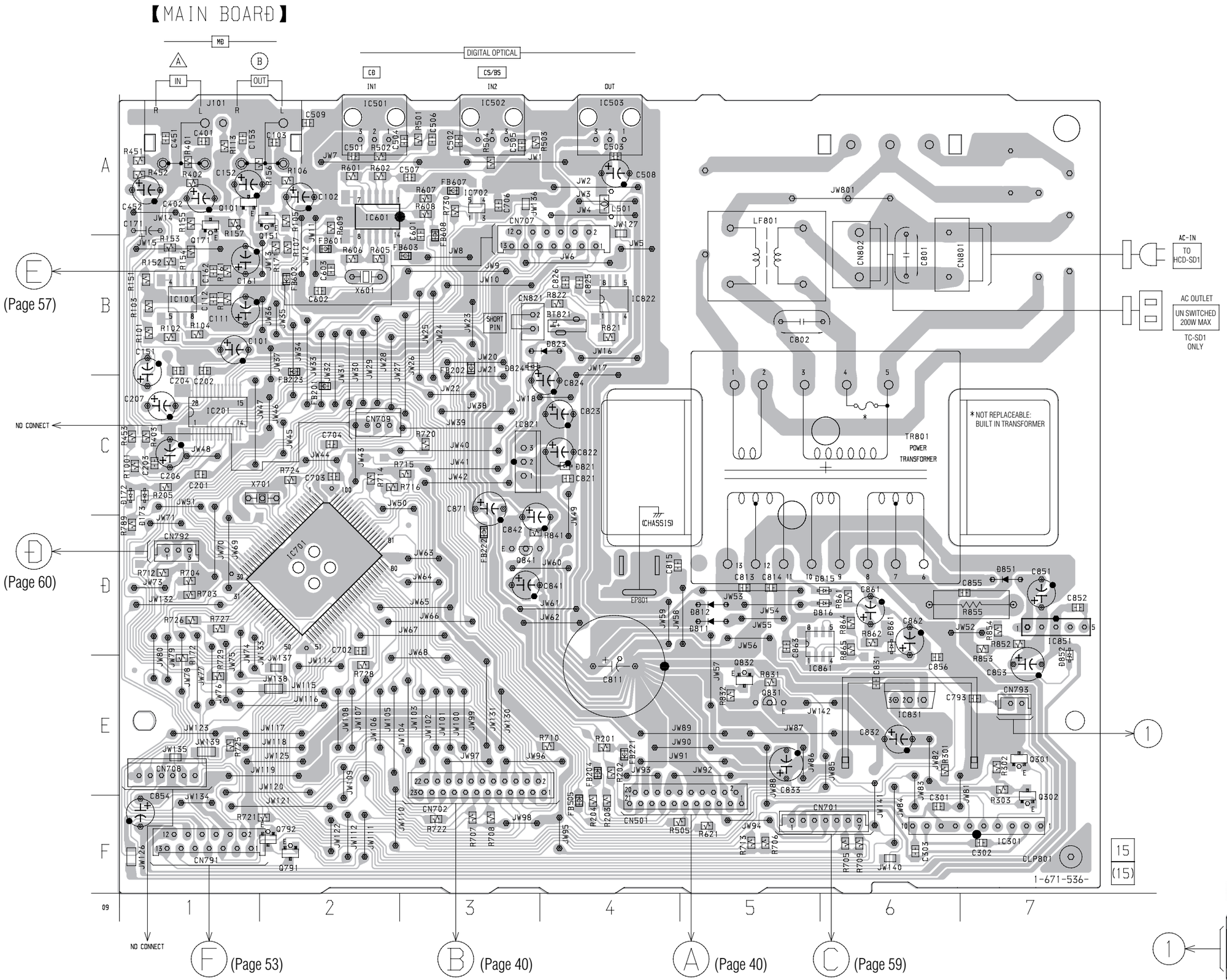
6-7. SCHEMATIC DIAGRAM – MAIN (2/2) SECTION –

- See page 38 for Waveforms.
- See page 62 for IC Block Diagrams.



6-8. PRINTED WIRING BOARD – MAIN SECTION –

• See page 32 for Circuit Boards Location.

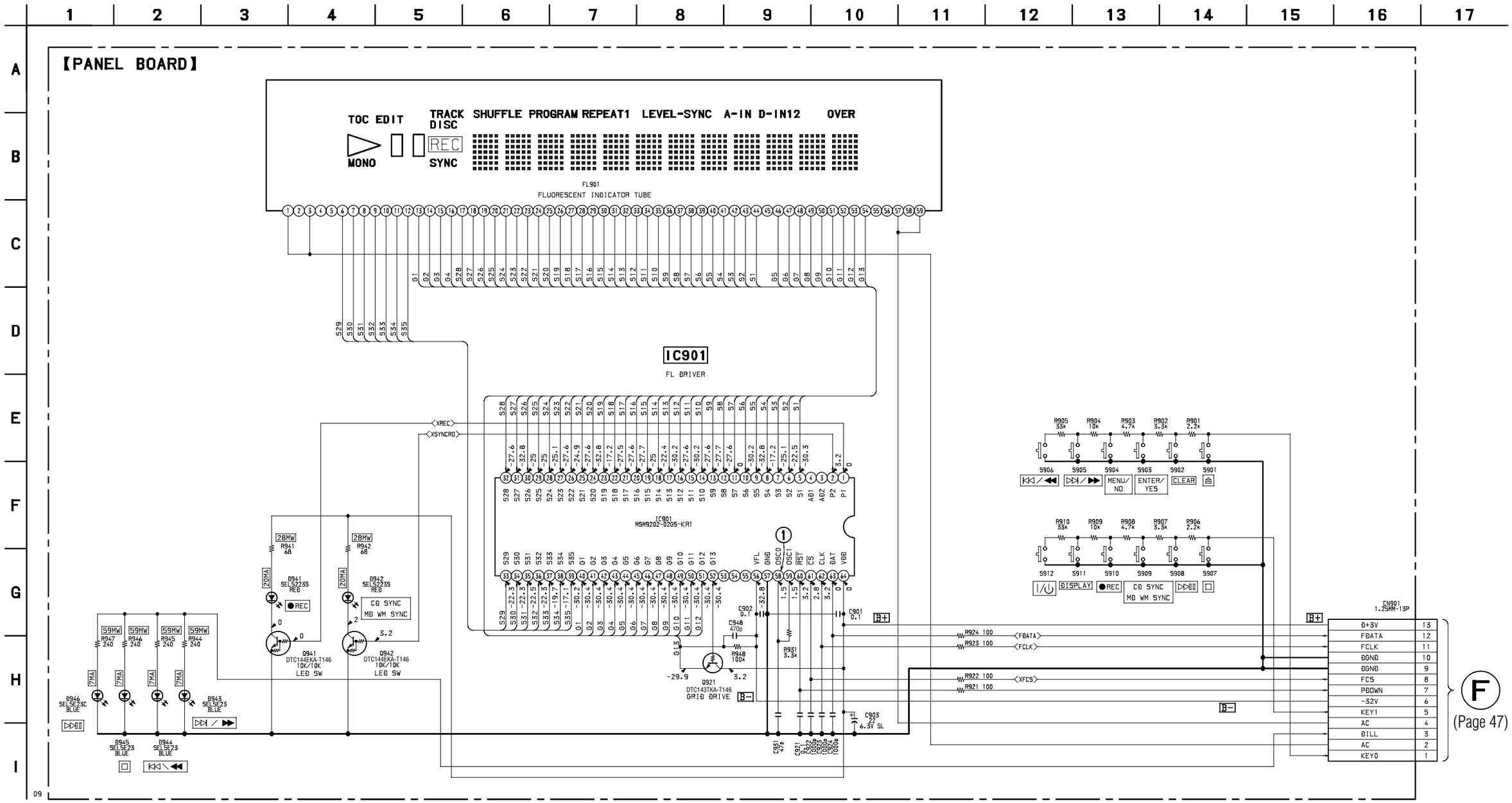


• **Semiconductor Location**

Ref. No.	Location
D172	C-1
D173	C-1
D811	D-5
D812	D-5
D815	D-6
D816	D-6
D821	C-4
D823	B-4
D824	B-3
D831	E-6
D832	E-5
D833	E-6
D851	D-7
D852	D-7
D861	D-6
IC101	B-1
IC201	C-1
IC301	F-7
IC501	A-2
IC502	A-3
IC503	A-4
IC601	A-2
IC701	D-2
IC702	A-3
IC821	C-3
IC822	B-4
IC831	E-6
IC851	D-7
IC861	E-6
Q101	A-1
Q151	A-2
Q171	A-1
Q301	E-7
Q302	E-7
Q791	F-2
Q792	F-2
Q831	E-5
Q832	E-5
Q841	D-3

6-9. SCHEMATIC DIAGRAM – PANEL SECTION –

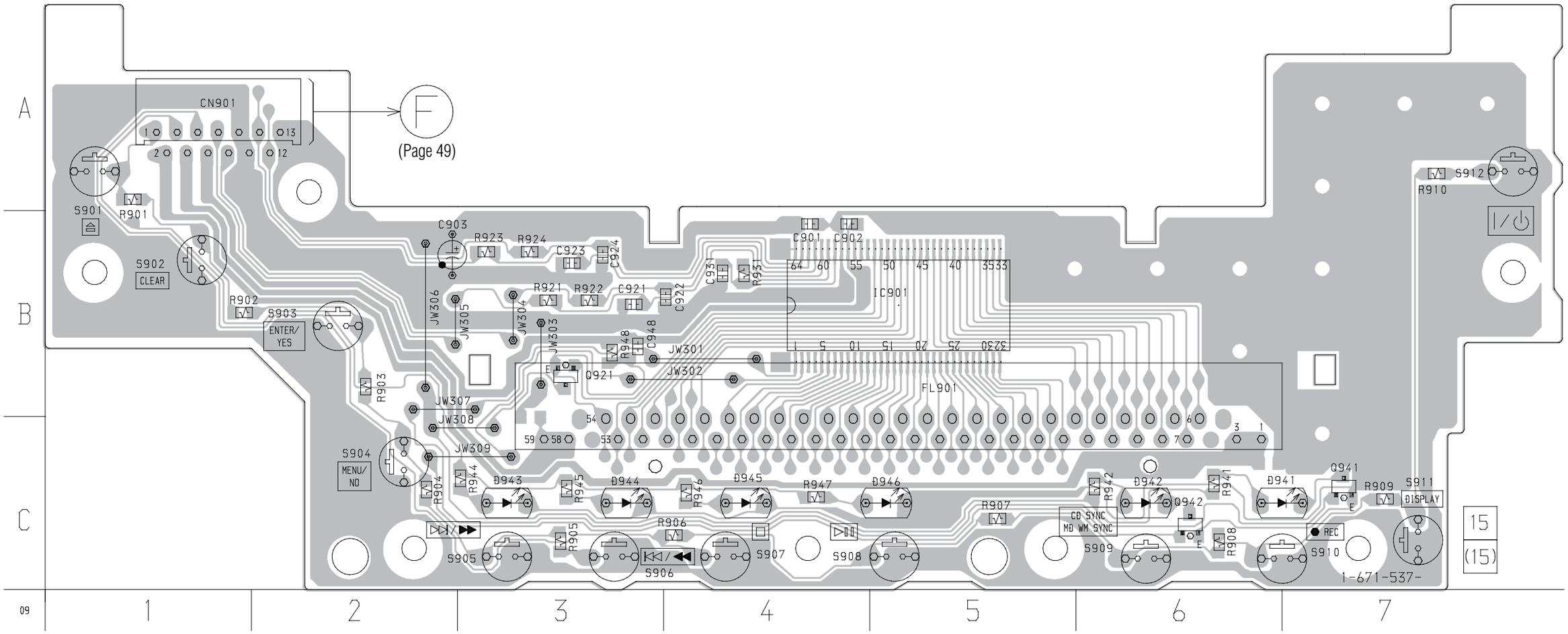
• See page 38 for Waveforms.



6-10. PRINTED WIRING BOARD – PANEL SECTION –

• See page 32 for Circuit Boards Location.

【PANEL BOARD】

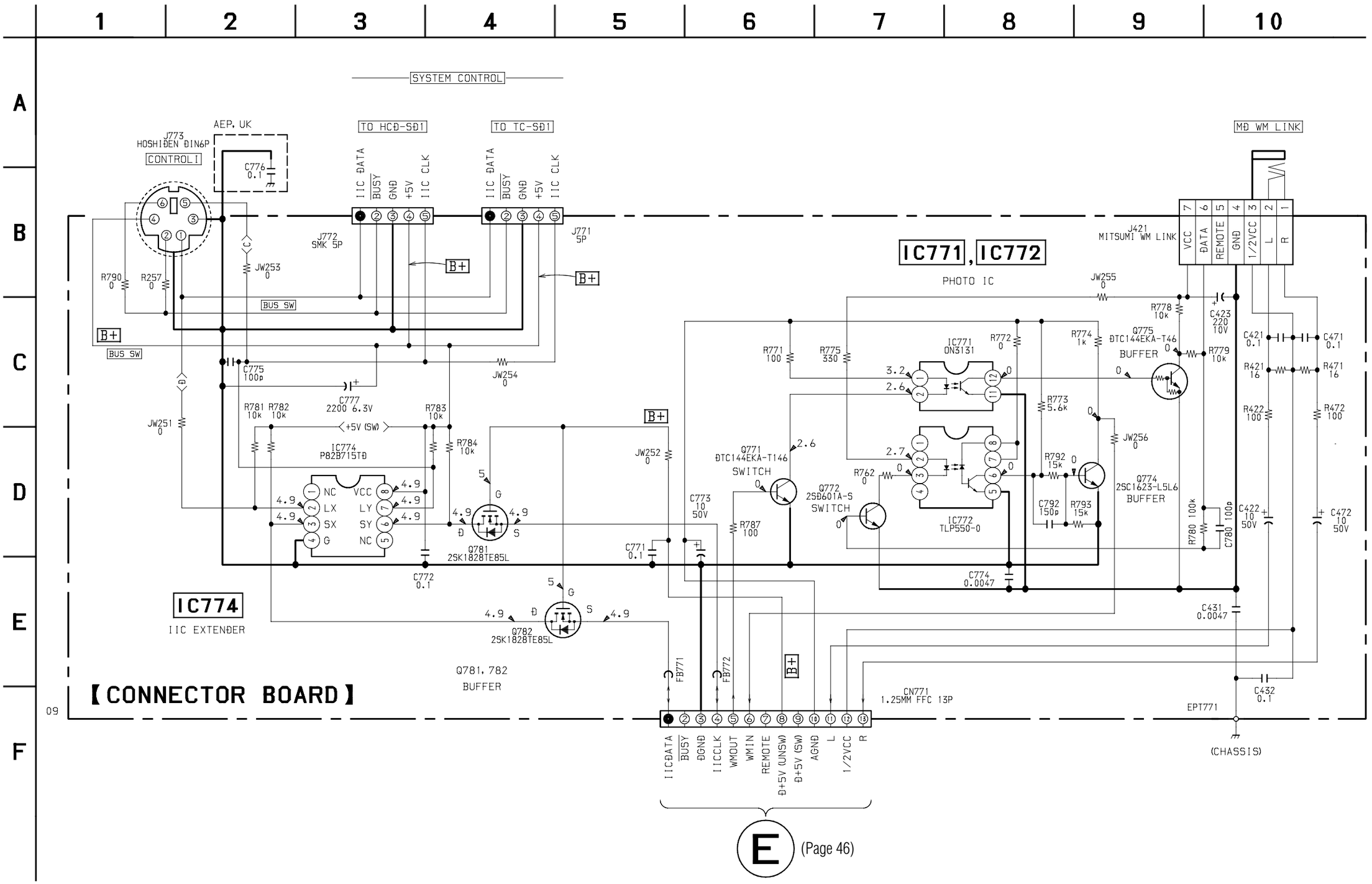


• Semiconductor Location

Ref. No.	Location
D941	C-7
D942	C-6
D943	C-3
D944	C-3
D945	C-4
D946	C-5
IC901	B-5
Q921	B-3
Q941	C-7
Q942	C-6

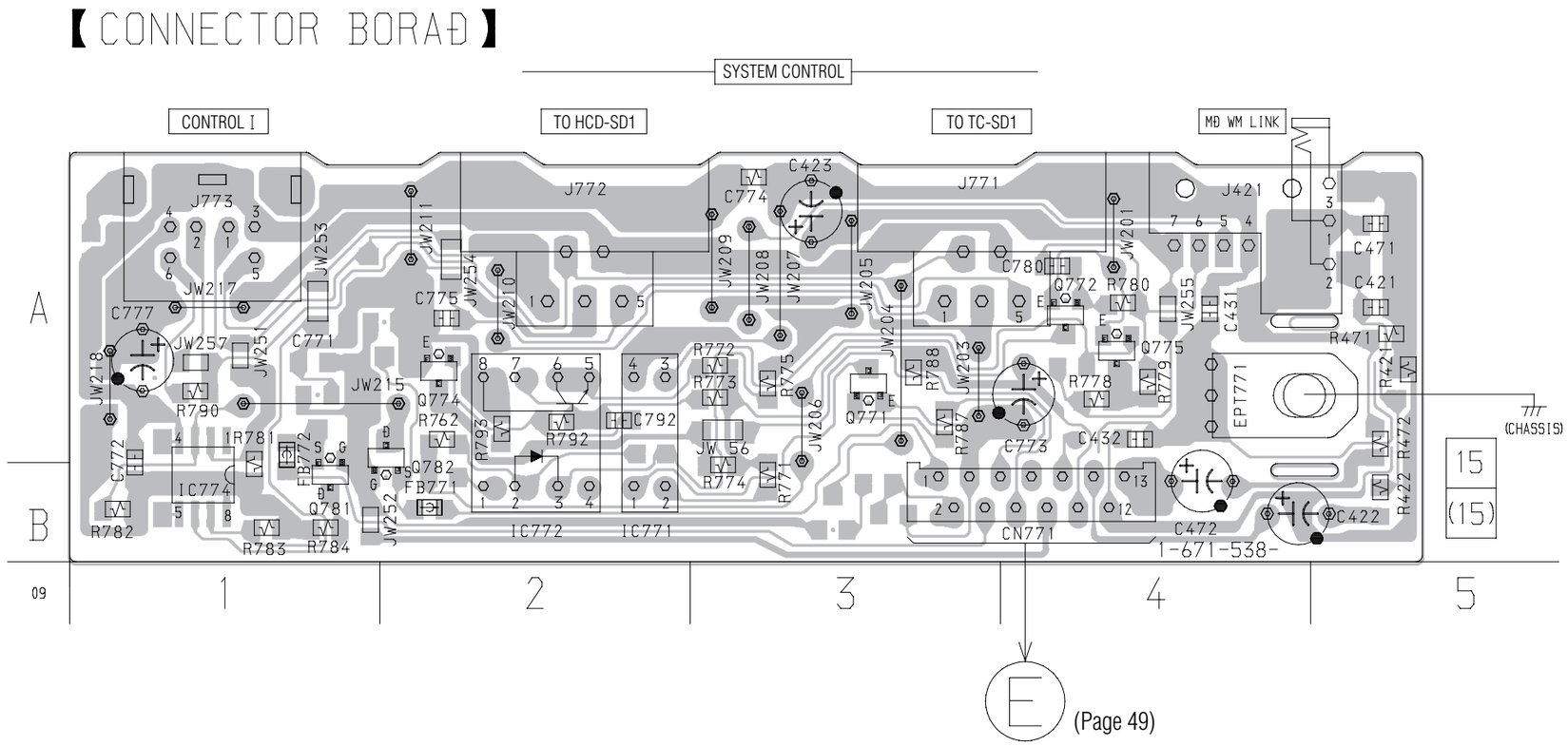
6-11. SCHEMATIC DIAGRAM – CONNECTOR SECTION –

• See page 63 for IC Block Diagrams.



6-12. PRINTED WIRING BOARD – CONNECTOR SECTION –

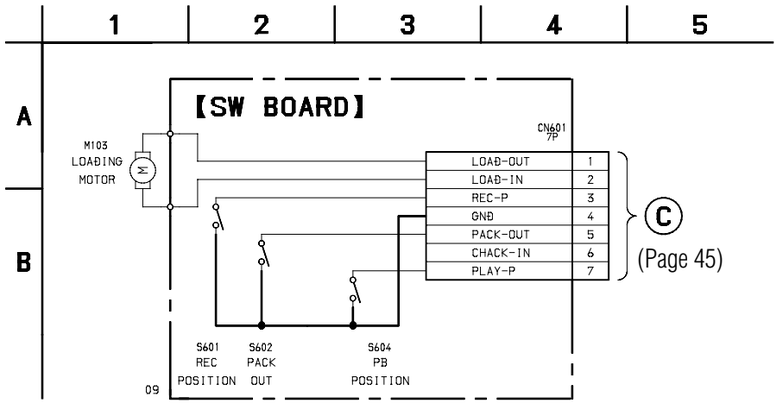
• See page 32 for Circuit Boards Location.



• Semiconductor Location

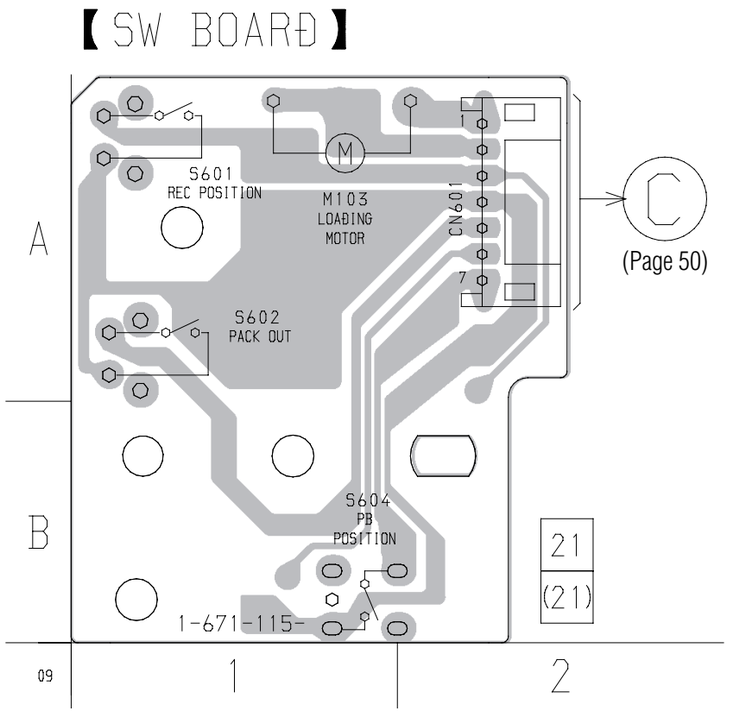
Ref. No.	Location
D781	A-1
D782	A-2
IC771	B-2
IC772	B-2
IC774	B-1
Q771	A-3
Q772	A-4
Q774	A-2
Q775	A-4
Q781	B-1
Q782	A-2
Q783	B-3

6-13. SCHEMATIC DIAGRAM – BD SWITCH SECTION –

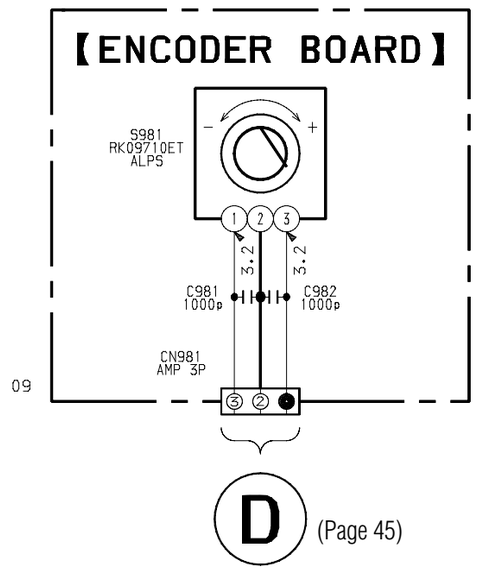


6-14. PRINTED WIRING BOARD – BD SWITCH SECTION –

• See page 32 for Circuit Boards Location.

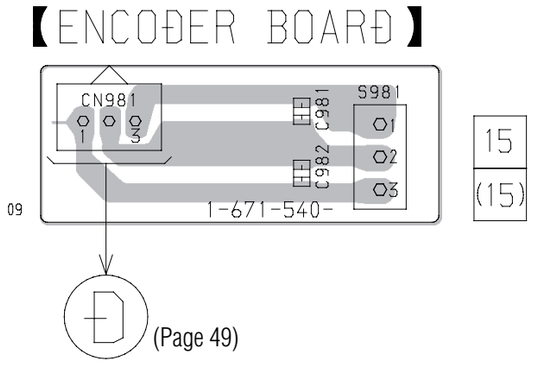


6-15. SCHEMATIC DIAGRAM – ENCODER SECTION –



6-16. PRINTED WIRING BOARD – ENCODER SECTION –

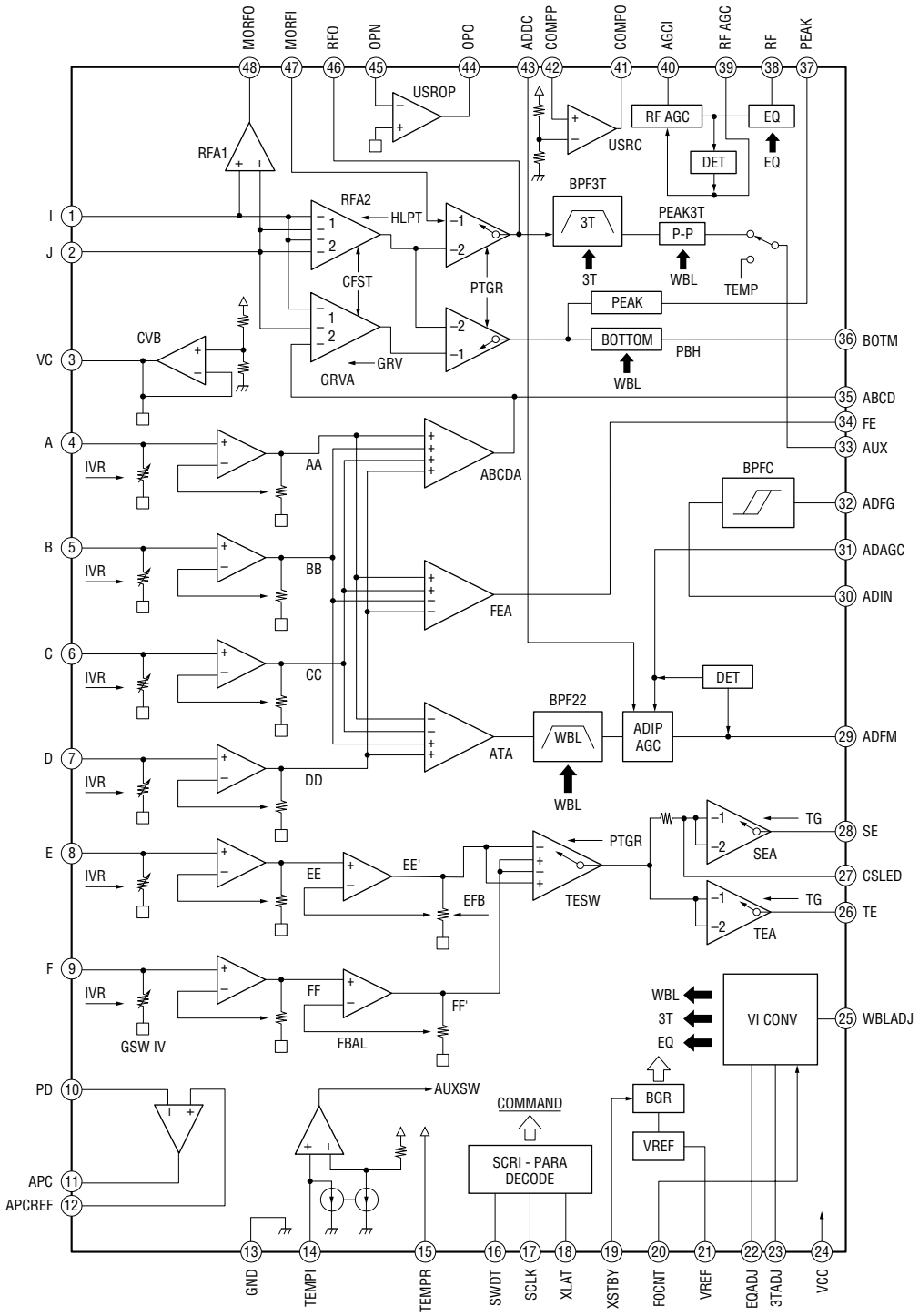
• See page 32 for Circuit Boards Location.



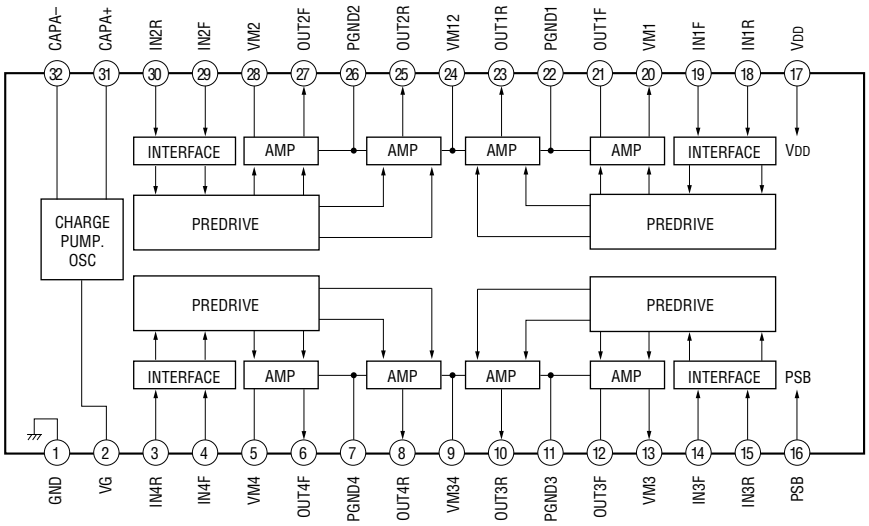
6-17. IC BLOCK DIAGRAMS

– BD Section –

IC101 CXA2523AR

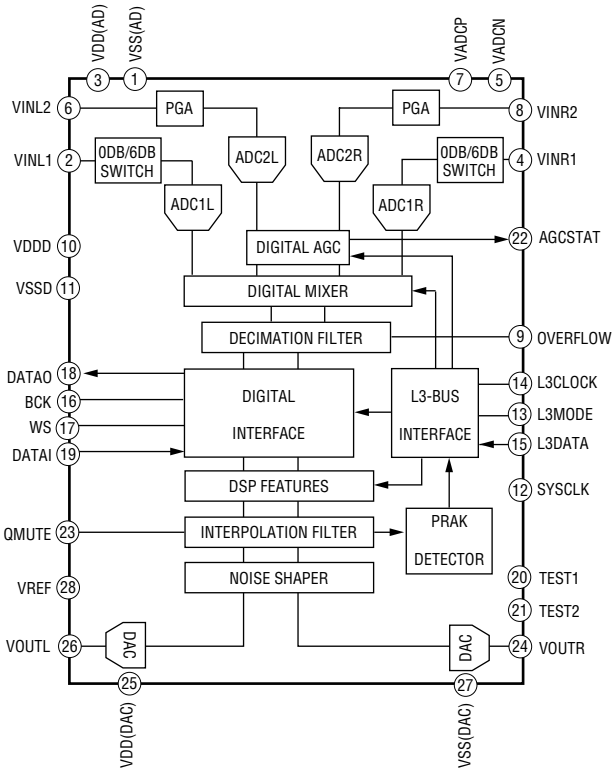


IC152 BH6511FS-E2

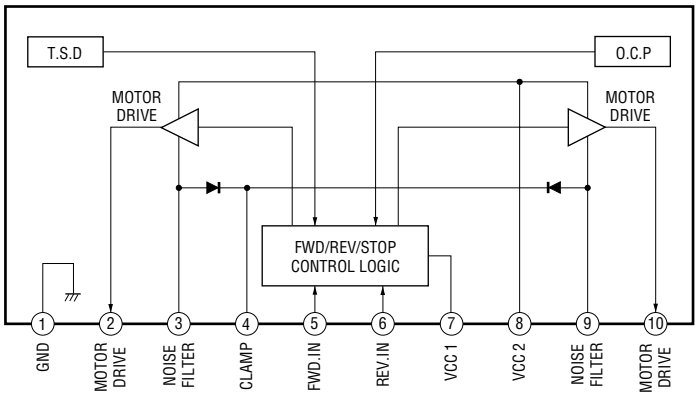


– MAIN Section –

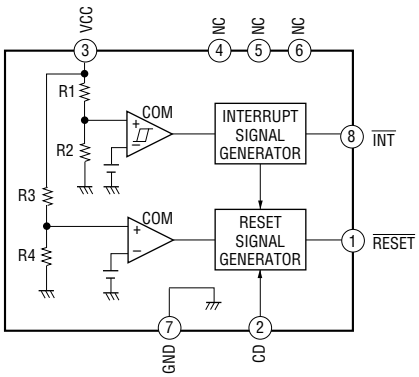
IC201 UDA1341TS/N2



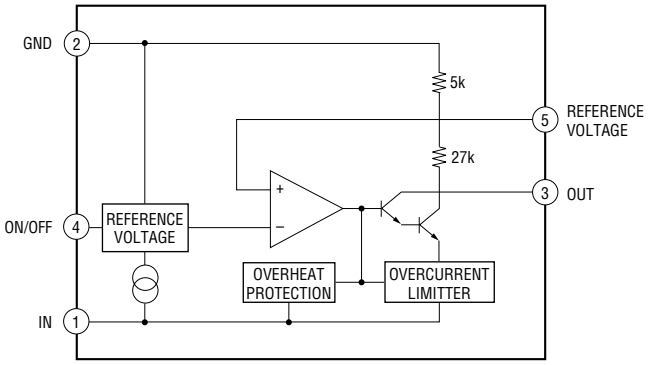
IC301 LB1641



IC822 M62016FP-E1

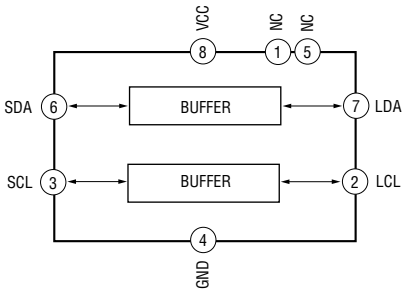


IC851 M5293L



– CONNECTOR Section –

IC774 P82B715TD.118



6-18. IC PIN FUNCTIONS

• IC101 CXA2523AR (RF Amplifier) (BD Board)

Pin No.	Pin Name	I/O	Function
1	I	I	I-V converted RF signal I input from the optical pick-up block detector
2	J	I	I-V converted RF signal J input from the optical pick-up block detector
3	VC	O	Middle point voltage (+1.65V) generation output terminal
4 to 9	A to F	I	Signal input from the optical pick-up detector
10	PD	I	Light amount monitor input terminal
11	APC	O	Laser amplifier output terminal to the automatic power control circuit
12	APCREF	I	Reference voltage input terminal for setting laser power
13	GND	—	Ground terminal
14	TEMPI	I	Connected to the temperature sensor
15	TEMPR	O	Output terminal for a temperature sensor reference voltage
16	SWDT	I	Writing serial data input from the CXD2652AR (IC121)
17	SCLK	I	Serial clock signal input from the CXD2652AR (IC121)
18	XLAT	I	Serial latch signal input from the CXD2652AR (IC121)
19	$\overline{\text{XSTBY}}$	I	Standby signal input terminal "L": standby (fixed at "H" in this set)
20	F0CNT	I	Center frequency control voltage input terminal of internal circuit (BPF22, BPF3T, EQ) input from the CXD2652AR (IC121)
21	VREF	O	Reference voltage output terminal Not used (open)
22	EQADJ	I	Center frequency setting terminal for the internal circuit (EQ)
23	3TADJ	I	Center frequency setting terminal for the internal circuit (BPF3T)
24	VCC	—	Power supply terminal (+3.3V)
25	WBLADJ	I	Center frequency setting terminal for the internal circuit (BPF22)
26	TE	O	Tracking error signal output to the CXD2652AR (IC121)
27	CSLED	I	Connected to the external capacitor for low-pass filter of the sled error signal
28	SE	O	Sled error signal output to the CXD2652AR (IC121)
29	ADFM	O	FM signal output of the ADIP
30	ADIN	I	Receives a ADIP FM signal in AC coupling
31	ADAGC	I	Connected to the external capacitor for ADIP AGC
32	ADFG	O	ADIP duplex signal (22.05 kHz ± 1 kHz) output to the CXD2652AR (IC121)
33	AUX	O	Auxiliary signal (I3 signal/temperature signal) output to the CXD2652AR (IC121)
34	FE	O	Focus error signal output to the CXD2652AR (IC121)
35	ABCD	O	Light amount signal (ABCD) output to the CXD2652AR (IC121)
36	BOTM	O	Light amount signal (RF/ABCD) bottom hold output to the CXD2652AR (IC121)
37	PEAK	O	Light amount signal (RF/ABCD) peak hold output to the CXD2652AR (IC121)
38	RF	O	Playback EFM RF signal output to the CXD2652AR (IC121)
39	RFAGC	I	Connected to the external capacitor for RF auto gain control circuit
40	AGCI	I	Receives a RF signal in AC coupling
41	COMPO	O	User comparator output terminal Not used (open)
42	COMPP	I	User comparator input terminal Not used (fixed at "L")
43	ADDC	I	Connected to the external capacitor for cutting the low band of the ADIP amplifier
44	OPO	O	User operational amplifier output terminal Not used (open)
45	OPN	I	User operational amplifier inversion input terminal Not used (fixed at "L")
46	RFO	O	RF signal output terminal
47	MORFI	I	Receives a MO RF signal in AC coupling
48	MORFO	O	MO RF signal output terminal

• **IC701 M30610MC-A01FP (SYSTEM CONTROL μCON) (MAIN BOARD)**

Pin No.	Pin Name	I/O	Function
1	WMOUT	O	MD WM LINK data out
2	WMCLK	I	MD WM LINK clock in
3	LEVEL-L	O	LEVEL-L DA output (Not used)
4	LEVEL-R	O	LEVEL-R DA output (Not used)
5	LEDDATA	O	LED DRIVER DATA output (Not used)
6	NC	O	Not used
7	LEDCLK	O	LED DRIVER CLOCK output (Not used)
8	BYTE	I	Data bus switching (Fixed at “L”)
9	CNVSS	I	Pulled down to “L”
10	XIN-T	I	Not used
11	XOUT-T	O	
12	S.RST	I	System reset
13	XOUT	O	Main clock output (10 MHz)
14	GND	–	Ground pin
15	XIN	I	Main clock output (10 MHz)
16	3.3V	–	Power supply 3.3V
17	NMI	I	Not used (Fixed at “H”)
18	P.DOWN	I	Power down detection
19	WMSYNC	I	MD WM LINK SYNC input
20	IICBUSY	O	I²C BUSY output (Not used)
21	L3CLK	O	AD/DA clock out
22	L3DATA	O	AD/DA data out
23	NC	O	Not used
24	ELEUP	O	Elevator control up output (Not used)
25	NC	O	Not used
26	ELEDOWN	O	Elevator control down output (Not used)
27	SQSY	I	SUBQ, ADIP sync input
28	RESETSW	I	Reset switch detection signal (Not used)
29	IICCLK	I/O	I²C clock
30	IICDATA	I/O	I²C data
31	FLDATA	O	FLD transmission data out
32	NC	O	Not used
33	FLCLK	O	FLD transmission data clock out
34	FLCS	O	FLD transmission data chip select out
35	SWDT	O	Serial data out
36	SRDT	I	Serial data in
37	SCLK	O	Serial clock out
38	ILLU	O	Illumination output (“H”:Light up)
39	SESOR	I	Main sensor detection signal (Front panel open detection “H”:OPEN)
40	SENSOR2	I	Sub sensor detection signal (Not used)
41	HEADDOWN	O	Recording head control down output (Not used)
42	HEADUP	O	Recording head control up output (Not used)
43	JOG0	I	Jog 0 input
44	JOG1	I	Jog 1 input
45	WMINV	O	MD WM LINK clock inverse signal output
46	LEDLATCH	O	LED driver latch output (Not used)
47	OPTSEL1	O	Optical input selection signal output (Not used)
48	DARST	O	A/D, D/A reset signal output (Not used)
49	MUTE	O	Line mute (“L”:MUTE)
50	STB	O	Power on/off output (“H”:POW ON)

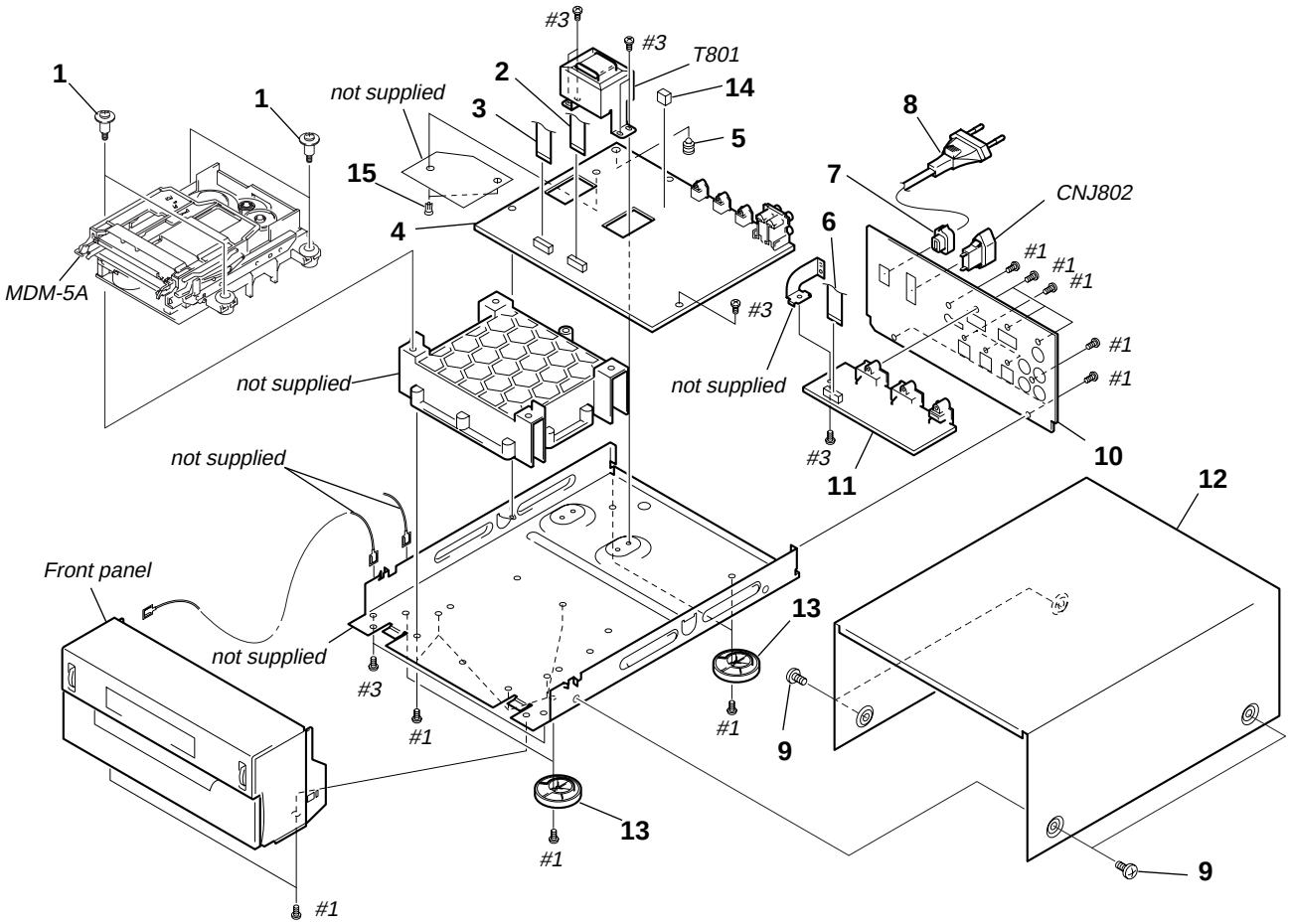
Pin No.	Pin Name	I/O	Function
51	CHAK-IN	I	Detection signal from IN switch
52	HOME	I	Detection signal form HOME switch
53	PACK-OUT	I	Detection signal from OUT switch
54	LDIN	O	Loading motor in control
55	LDOUT	O	Loading motor out control
56	LD-LOW	O	Loading motor voltage control output
57	LDON	O	Laser power ON/OFF
58	REFLECT	I	Disc reflection rate detection
59	PROTECT	I	Disc hole detection
60	PB-P	I	Detection signal from playback position detection switch
61	REC/PB	O	Not used
62	3.3V	–	Power supply 3.3V
63	LIMITIN	I	Detection signal from limit switch
64	GND	–	Ground pin
65	MOD	O	High frequency superimposing ON/OFF output
66	XLAT	O	Latch signal output to serial pulse
67	WRPWR	O	BD light power ON/OFF output
68	LODINGSEL	I	LOADING SELECT input (Fixed at “L”)
69	L3MODE	I	AD/DA MODE signal output
70	MODEL	I	Model selection (Fixed at “H”)
71	DIST	I	Destination selection (Fixed at “H”)
72	SCTX	O	Timing for sending write data to CXD2654
73	XINT	I	CXD2654 interrupt status input
74	REC-P	I	Not used
75	DQSY	I	Digital in sync input
76	NC	O	Not used
77	DIGRST	O	CXD2654, motor driver reset signal
78	SENS	I	Internal status
79	MNT3	I	Spindle servo lock status monitor
80	MNT2	I	Command execution status monitor
81	MNT1	I	Track jump signal
82	MNT0	I	Focus OK signal
83	SENSORSW	O	MAIN SENSOR waveform switching output (Not used)
84	DISK5	I	DISC5 IN SW (Not used)
85	DISK1	I	DISC1 IN SW (Not used)
86	DISK2	I	DISC2 IN SW (Not used)
87	SCL	O	Clock signal to backup memory
88	SDA	I/O	Data signal to backup memory
89	DISK4	I	DISC4 IN SW (Not used)
90	DISK3	I	DISC3 IN SW (Not used)
91	HEADSWDWN	I	Recording head down detection signal (Not used)
92	HEADSWUP	I	Recording head up detection signal (Not used)
93	KEY3	I	Key 3 (A/D) (Not used)
94	KEY2	I	Key 2 (A/D) (Not used)
95	KEY1	I	Key 1 (A/D)
96	AVSS	–	Ground pin
97	KEY0	I	Key 0 (A/D)
98	VREF	–	A/D reference voltage 3.3V
99	3.3V	–	Power supply 3.3V
100	WMCLK	I	MD WM LINK data input

SECTION 7
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

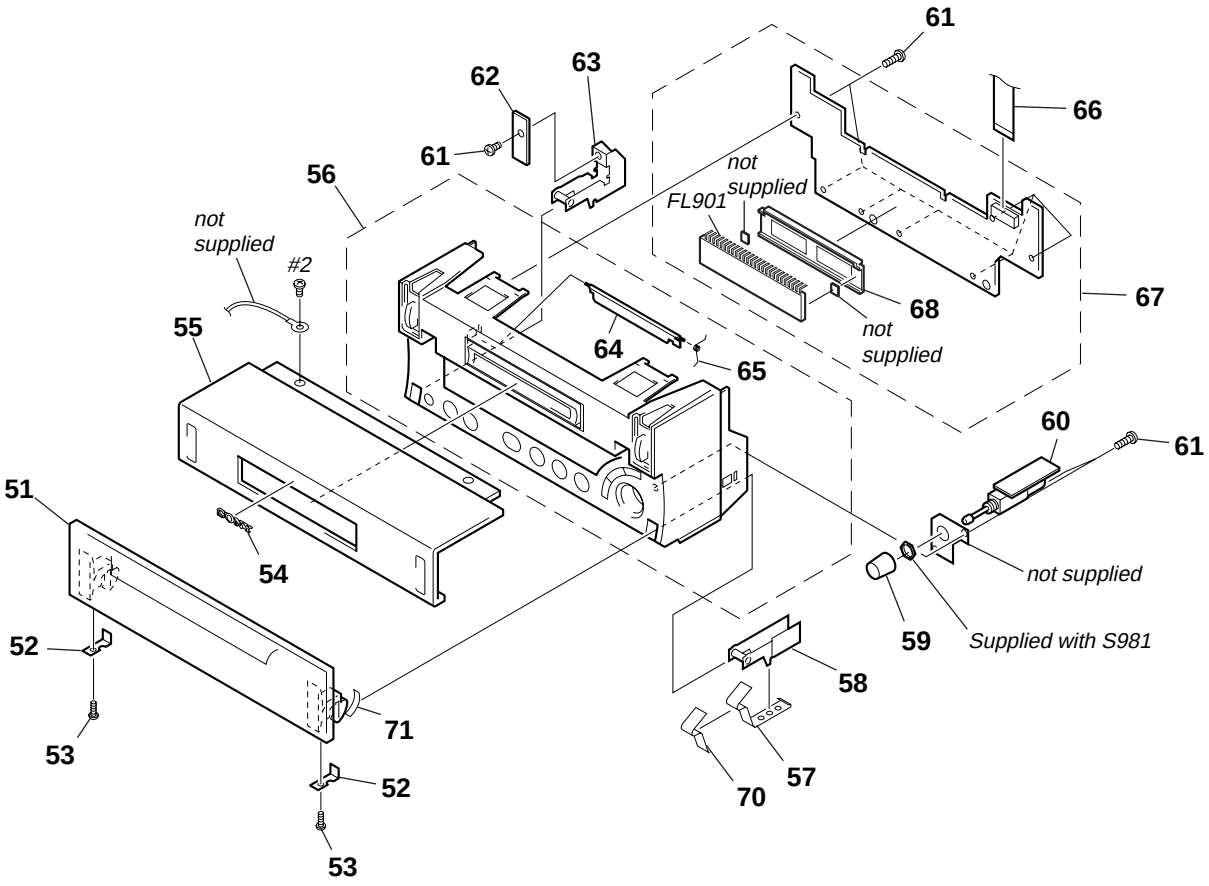
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

7-1. CASE AND BACK PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	4-212-589-01	SCREW (+BVTPWH M3), STEP	
2	1-783-140-11	WIRE (FLAT TYPE) (23 CORE)	
3	1-783-139-11	WIRE (FLAT TYPE) (21 CORE)	
* 4	A-4724-618-A	MAIN BOARD, COMPLETE (AEP,UK)	
* 4	A-4724-626-A	MAIN BOARD, COMPLETE (SP,HK)	
* 5	4-944-316-01	HOLDER, PC BOARD	
6	1-769-969-11	WIRE (FLAT TYPE) (13 CORE)	
* 7	3-703-244-00	BUSHING (2104), CORD	
⚠8	1-783-499-11	CORD, POWER	
9	3-363-099-51	SCREW (CASE 3 TP2)	
* 10	4-212-572-11	PANEL (MD), BACK (AEP,UK)	
* 10	4-212-572-21	PANEL (MD), BACK (SP,HK)	
* 11	1-671-538-11	CONNECTOR BOARD	
* 12	4-212-561-31	CASE	
13	X-4950-994-1	FOOT ASSY	
14	1-569-972-21	SOCKET, SHORT 2P	
15	3-531-576-01	RIVET	
⚠CNJ802	1-526-794-11	OUTLET, AC	
⚠T801	1-431-685-31	TRANSFORMER, POWER	

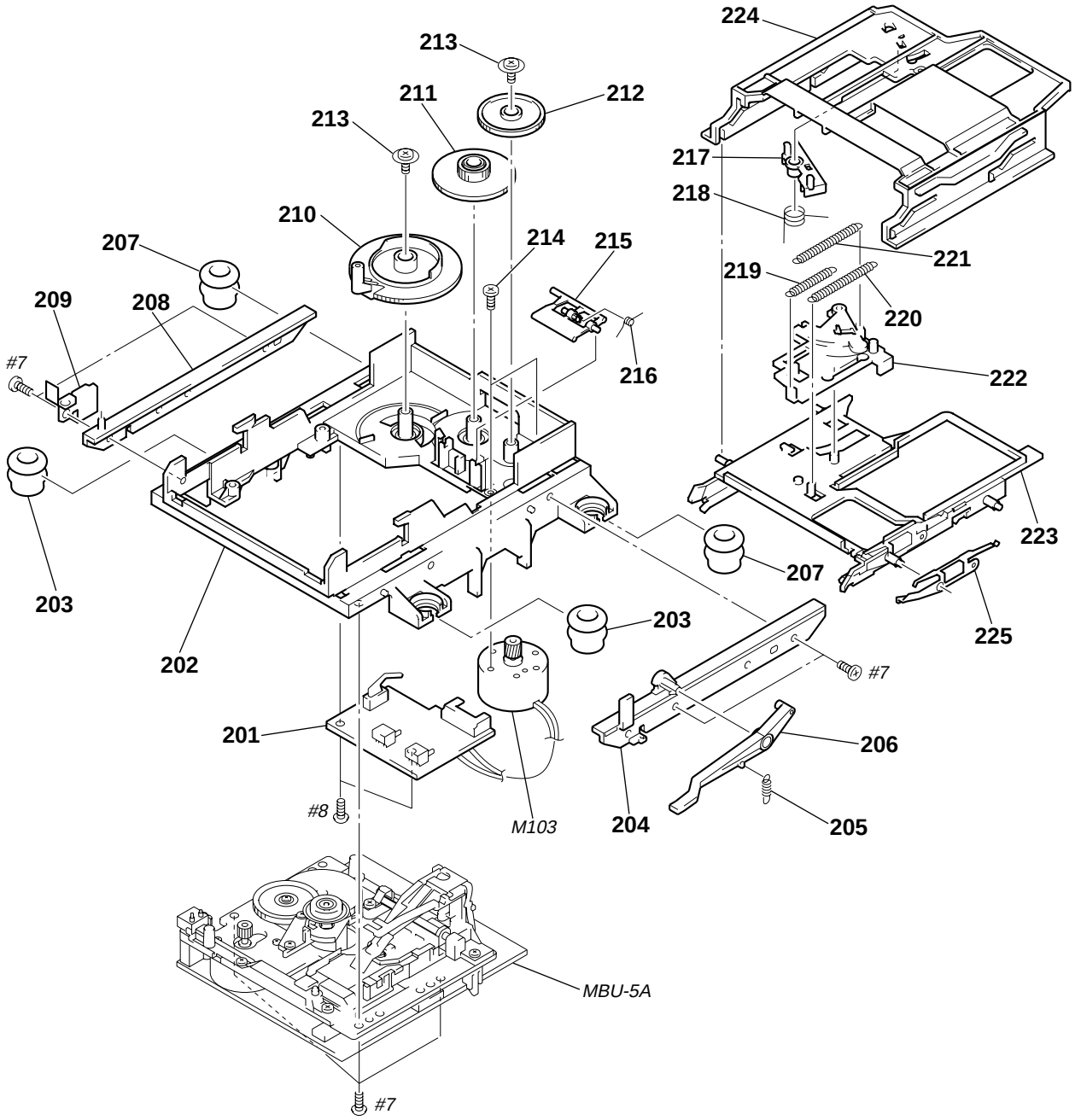
7-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	X-4950-581-1	GLASS (MD) ASSY	
52	4-212-584-01	BRACKET (SHAFT)	
53	4-993-007-01	SCREW (M2.6X6), +P TAPPING	
54	4-942-636-21	EMBLEM (NO.3.5), SONY	
55	4-212-551-11	PANEL (AL-MD), FRONT	
56	X-4950-996-1	PANEL (MD) ASSY , FRONT	
57	4-212-580-11	SPRING (GLASS)	
58	X-4950-999-1	BRACKET (R) ASSY	
59	4-212-553-11	KNOB (JOG)	
* 60	1-671-540-11	ENCODER BOARD	

Ref. No.	Part No.	Description	Remark
61	4-951-620-01	SCREW (2.6X8), +BVTP	
* 62	1-671-539-11	PANEL SW BOARD	
63	X-4950-998-1	BRACKET (L) ASSY	
64	4-996-690-91	LID (CARTRIDGE)	
65	4-976-593-01	SPRING (LID), TORSION	
66	1-751-086-11	WIRE (FLAT TYPE) (13 CORE)	
* 67	A-4724-619-A	PANEL BOARD, COMPLETE	
* 68	4-212-590-11	HOLDER (FL)	
70	4-213-692-02	TAPE (SPRING)	
71	4-214-458-01	TAPE	
FL901	1-517-804-11	INDICATOR TUBE, FLUORESCENT	

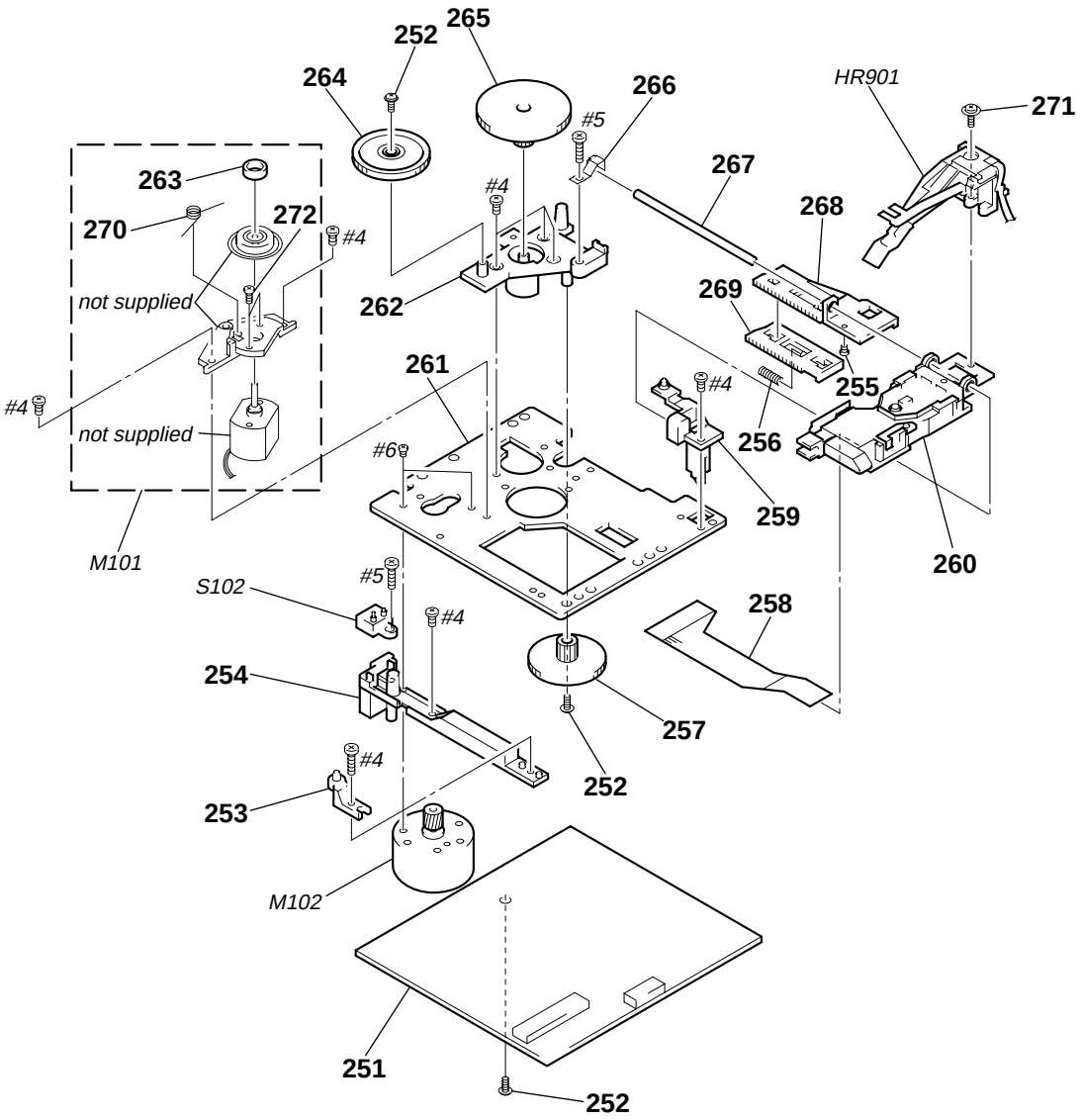
7-3. MECHANISM DECK SECTION (MDM-5A)



Ref. No.	Part No.	Description	Remark
* 201	1-671-115-21	SW BOARD	
* 202	4-996-217-01	CHASSIS	
203	4-996-223-11	INSULATOR (F)	
* 204	4-996-218-01	BRACKET (GUIDE R)	
205	4-996-277-01	SPRING (O/C), TENSION	
206	4-996-226-01	LEVER (O/C)	
207	4-999-347-01	INSULATOR (R)	
* 208	4-996-225-01	BRACKET (GUIDE L)	
209	4-988-466-21	SPRING (ELECTROSTATIC), LEAF	
210	4-996-219-01	GEAR (CAM GEAR)	
211	4-996-220-01	GEAR (A)	
212	4-996-221-01	GEAR (B)	
213	4-933-134-01	SCREW (+PTPWH M2.6X6)	
214	4-996-224-11	SCREW (1.7X3), +PWH	

Ref. No.	Part No.	Description	Remark
215	4-996-227-01	LEVER (HEAD)	
216	4-996-229-01	SPRING (HEAD LEVER), TORSION	
217	4-996-212-01	LEVER (LIMITTER)	
218	4-996-213-01	SPRING (LIMITTER), TORSION	
219	4-996-214-01	SPRING (SLIDER), TENSION	
220	4-996-216-01	SPRING (HOLDER), TENSION	
221	4-210-396-01	SPRING (LOCK LEVER), TENSION	
222	X-4949-246-1	SLIDER ASSY	
223	X-4949-245-1	HOLDER ASSY	
* 224	4-996-211-01	SLIDER (CAM)	
225	4-998-763-24	SPRING (SHUTTER), LEAF	
M103	X-4949-264-1	MOTOR ASSY, LOADING	

7-4. BASE UNIT SECTION (MBU-5A)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 251	A-4699-893-A	BD BOARD, COMPLETE	
252	3-372-761-01	SCREW (M1.7), TAPPING	
* 253	4-996-267-01	BASE (BU-D)	
* 254	4-996-255-01	BASE (BU-C)	
255	4-900-590-01	SCREW, PRECISION SMALL	
256	4-996-258-01	SPRING, COMPRESSION	
257	4-996-262-01	GEAR (SL-C)	
* 258	1-667-954-11	FLEXIBLE BOARD	
* 259	4-996-253-12	BASE (BU-A)	
⚠260	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1NP	
* 261	4-996-252-01	CHASSIS, BU	
* 262	4-996-254-01	BASE (BU-B)	
263	4-967-688-11	MAGNET, ABSORPTION	
264	4-996-260-01	GEAR (SL-A)	
265	4-996-261-01	GEAR (SL-B)	
266	4-996-264-01	SPRING (SHAFT), LEAF	
267	4-996-265-01	SHAFT, MAIN	
268	4-996-256-11	SL (BASE)	
269	4-996-257-01	RACK (SL)	
270	4-996-263-01	SPRING (CLV), TORSION	
271	4-988-560-01	SCREW (+P 1.7X6)	
272	4-211-036-01	SCREW (1.7X2.5), +PWH	
HR901	1-500-502-11	HEAD, OVER LIGHT	
M101	A-4672-475-A	MOTOR ASSY, SPINDLE	
M102	A-4672-474-A	MOTOR ASSY, SLED	
S102	1-762-148-21	SWITCH, PUSH (2 KEY)	

SECTION 8
ELECTRICAL PARTS LIST

BD

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H
- Abbreviation
  HK : Hong Kong model
  SP : Singapore model

Ref. No.	Part No.	Description			Remark
*	A-4699-893-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-125-822-11	TANTALUM	10uF	20%	10V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-125-822-11	TANTALUM	10uF	20%	10V
C104	1-125-822-11	TANTALUM	10uF	20%	10V
C105	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C108	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C112	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C113	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C115	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C116	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C117	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C118	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C119	1-125-822-11	TANTALUM	10uF	20%	10V
C121	1-125-822-11	TANTALUM	10uF	20%	10V
C122	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C132	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C146	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C153	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C156	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C158	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C164	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-125-822-11	TANTALUM	10uF	20%	10V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-117-970-11	ELECT CHIP	22uF	20%	10V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C187	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C188	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C189	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C190	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C191	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C196	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C197	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-569-479-21	CONNECTOR, FPC 21P			
CN102	1-784-833-21	CONNECTOR,FFC(LIF(NON-ZIF))21P			
CN103	1-784-834-21	CONNECTOR,FFC(LIF(NON-ZIF))23P			
CN104	1-770-687-11	CONNECTOR, FFC/FPC 4P			
CN110	1-695-440-21	PIN, CONNECTOR (PC BOARD) 6P			
		< DIODE >			
D101	8-719-988-61	DIODE 1SS355			
D181	8-719-046-86	DIODE F1J6TP			
D183	8-719-046-86	DIODE F1J6TP			
		< IC >			
IC101	8-752-080-95	IC CXA2523AR			
IC103	8-729-903-10	IC TRANSISTOR FMW1			
IC121	8-752-389-44	IC CXD2654R			
IC123	8-759-096-87	IC TC7WU04FU(TE12R)			
IC124	8-759-498-44	IC MSM51V4400-70TS-K			
IC152	8-759-430-25	IC BH6511FS-E2			
IC171	8-759-487-04	IC S-24C02AFJA-TB			
IC181	8-759-481-17	IC MC74ACT08DTR2			
IC192	8-759-460-72	IC BA033FP-E2			
		< COIL >			
L101	1-414-813-11	FERRITE	0uH		
L102	1-414-813-11	FERRITE	0uH		
L103	1-414-813-11	FERRITE	0uH		
L105	1-414-813-11	FERRITE	0uH		
L106	1-414-813-11	FERRITE	0uH		
L121	1-414-813-11	FERRITE	0uH		

BD CONNECTOR

Ref. No.	Part No.	Description			Remark
L122	1-414-813-11	FERRITE	0uH		
L151	1-412-029-11	INDUCTOR CHIP	10uH		
L152	1-412-029-11	INDUCTOR CHIP	10uH		
L153	1-412-032-11	INDUCTOR CHIP	100uH		
L154	1-412-032-11	INDUCTOR CHIP	100uH		
L161	1-414-813-11	FERRITE	0uH		
L162	1-414-813-11	FERRITE	0uH		
L181	1-216-295-91	SHORT	0		
		< TRANSISTOR >			
Q101	8-729-028-91	TRANSISTOR	RT1P441M-TP-1		
Q102	8-729-026-53	TRANSISTOR	2SA1576A-T106-QR		
Q103	8-729-028-99	TRANSISTOR	RT1P441M-TP-1		
Q104	8-729-028-99	TRANSISTOR	RT1P441M-TP-1		
Q162	8-729-101-07	TRANSISTOR	2SB798-DL		
Q163	8-729-028-91	TRANSISTOR	RT1P441M-TP-1		
Q181	8-729-018-75	TRANSISTOR	2SJ278MY		
Q182	8-729-017-65	TRANSISTOR	2SK1764KY		
		< RESISTOR >			
R103	1-216-049-91	RES,CHIP	1K	5%	1/10W
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R106	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R107	1-216-113-00	METAL CHIP	470K	5%	1/10W
R109	1-216-295-91	SHORT	0		
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
R111	1-216-295-91	SHORT	0		
R112	1-216-089-91	RES,CHIP	47K	5%	1/10W
R113	1-216-049-91	RES,CHIP	1K	5%	1/10W
R115	1-216-049-91	RES,CHIP	1K	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W
R120	1-216-025-91	RES,CHIP	100	5%	1/10W
R121	1-216-097-91	RES,CHIP	100K	5%	1/10W
R123	1-216-295-91	SHORT	0		
R124	1-216-025-91	RES,CHIP	100	5%	1/10W
R125	1-216-025-91	RES,CHIP	100	5%	1/10W
R127	1-216-025-91	RES,CHIP	100	5%	1/10W
R129	1-216-295-91	SHORT	0		
R131	1-216-073-00	METAL CHIP	10K	5%	1/10W
R132	1-216-097-91	RES,CHIP	100K	5%	1/10W
R133	1-216-117-00	METAL CHIP	680K	5%	1/10W
R134	1-216-049-91	RES,CHIP	1K	5%	1/10W
R135	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R136	1-216-049-91	RES,CHIP	1K	5%	1/10W
R137	1-216-295-91	SHORT	0		
R140	1-216-029-00	METAL CHIP	150	5%	1/10W
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-025-91	RES,CHIP	100	5%	1/10W
R145	1-216-073-00	METAL CHIP	10K	5%	1/10W
R146	1-216-037-00	METAL CHIP	330	5%	1/10W
R147	1-216-025-91	RES,CHIP	100	5%	1/10W
R148	1-216-045-00	METAL CHIP	680	5%	1/10W
R149	1-216-073-00	METAL CHIP	10K	5%	1/10W
R150	1-216-295-91	SHORT	0		
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R158	1-216-097-91	RES,CHIP	100K	5%	1/10W
R159	1-216-097-91	RES,CHIP	100K	5%	1/10W
R160	1-216-295-91	SHORT	0		
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R162	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R163	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R164	1-216-045-00	METAL CHIP	680	5%	1/10W
R165	1-216-097-91	RES,CHIP	100K	5%	1/10W
R166	1-220-149-11	REGISTER	2.2	10%	1/2W
R167	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R169	1-219-724-11	METAL CHIP	1	1%	1/4W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R173	1-216-121-91	RES,CHIP	1M	5%	1/10W
R175	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R177	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R179	1-216-085-00	METAL CHIP	33K	5%	1/10W
R180	1-216-073-00	METAL CHIP	10K	5%	1/10W
R182	1-216-089-91	RES,CHIP	47K	5%	1/10W
R183	1-216-089-91	RES,CHIP	47K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-081-00	METAL CHIP	22K	5%	1/10W
R186	1-216-089-91	RES,CHIP	47K	5%	1/10W
R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R195	1-216-073-00	METAL CHIP	10K	5%	1/10W
R196	1-216-295-91	SHORT	0		
R197	1-216-295-91	SHORT	0		
		< SWITCH >			
S101	1-762-596-21	SWITCH, PUSH (1 KEY)(LIMIT IN)			
S102	1-762-148-21	SWITCH, PUSH (2 KEY)			
**********					
*	1-671-538-11	CONNECTOR BOARD			
		**********			
		< CAPACITOR >			
C421	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C422	1-126-964-11	ELECT	10uF	20%	50V
C423	1-126-934-11	ELECT	220uF	20%	10V
C431	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C432	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C471	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C472	1-126-964-11	ELECT	10uF	20%	50V
C771	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C772	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C773	1-126-964-11	ELECT	10uF	20%	50V
C774	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C775	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C776	1-163-038-91	CERAMIC CHIP	0.1uF		25V (AEP,UK)
C777	1-104-656-11	ELECT	2200uF	20%	6.3V
C778	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C780	1-163-251-11	CERAMIC CHIP	100PF	5%	50V

Ref. No.	Part No.	Description			Remark
C792	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
		< CONNECTOR >			
* CN771	1-568-832-11	SOCKET, CONNECTOR 13P			
		< GROUND TERMINAL >			
* EPT771	1-537-738-21	TERMINAL, EARTH			
		< FERRITE BEAD >			
FB771	1-500-445-21	FERRITE 0UH			
FB772	1-500-445-21	FERRITE 0UH			
		< IC >			
IC771	8-749-015-19	IC PHOTO COUPLER ON3131-SA.S0			
IC772	8-719-802-25	IC PHOTO TRANSISTOR TLP550-0			
IC774	8-759-549-80	IC P82B715TD.118			
		< JACK >			
J421	1-785-382-21	JACK, MINIATURE(+ CONNECTOR)4P (MD WM LINK)			
* J771	1-566-856-11	SOCKET, CONNECTOR 5P (TC-SD1)			
* J772	1-566-856-11	SOCKET, CONNECTOR 5P (HCD-SD1)			
J773	1-580-394-11	CONNECTOR DIN 6P (AEP,UK)			
J773	1-774-136-11	CONNECTOR 6P (CONTROL) (SP,HK)			
		< JUMPER RESISTOR >			
JW251	1-216-295-91	SHORT	0		
JW252	1-216-295-91	SHORT	0		
JW253	1-216-296-91	SHORT	0		
JW254	1-216-296-91	SHORT	0		
JW255	1-216-295-91	SHORT	0		
JW256	1-216-296-91	SHORT	0		
JW257	1-216-296-91	SHORT	0		
		< TRANSISTOR >			
Q771	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q772	8-729-422-29	TRANSISTOR	2SD601A-S		
Q774	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q775	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q781	8-729-025-28	TRANSISTOR	2SK1828		
Q782	8-729-025-28	TRANSISTOR	2SK1828		
		< RESISTOR >			
R421	1-216-608-11	METAL CHIP	16	0.5%	1/10W
R422	1-216-025-91	RES,CHIP	100	5%	1/10W
R471	1-216-608-11	METAL CHIP	16	0.5%	1/10W
R472	1-216-025-91	RES,CHIP	100	5%	1/10W
R762	1-216-295-91	SHORT	0		
R771	1-216-025-91	RES,CHIP	100	5%	1/10W
R772	1-216-295-91	SHORT	0		
R773	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R774	1-216-049-91	METAL CHIP	1K	5%	1/10W
R775	1-216-037-91	METAL CHIP	330	5%	1/10W
R777	1-216-031-00	METAL CHIP	180	5%	1/10W
R778	1-216-073-00	METAL CHIP	10K	5%	1/10W
R779	1-216-073-00	METAL CHIP	10K	5%	1/10W
R780	1-216-097-91	RES,CHIP	100K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R781	1-216-073-00	METAL CHIP	10K	5%	1/10W
R782	1-216-073-00	METAL CHIP	10K	5%	1/10W
R783	1-216-073-00	METAL CHIP	10K	5%	1/10W
R784	1-216-073-00	METAL CHIP	10K	5%	1/10W
R787	1-216-025-91	RES,CHIP	100	5%	1/10W
R790	1-216-295-91	SHORT	0		
R792	1-216-077-00	RES,CHIP	15K	5%	1/10W
R793	1-216-077-00	RES,CHIP	15K	5%	1/10W
**********					
*	1-671-540-11	ENCODER BOARD **********			
		< CAPACITOR >			
C981	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C982	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
		< SWITCH >			
S981	1-418-000-11	ENCODER,ROTARY(WITH PUSH ROCK)			
**********					
*	A-4724-618-A	MAIN BOARD, COMPLETE (AEP,UK) **********			
*	A-4724-626-A	MAIN BOARD, COMPLETE (SP,HK) **********			
*	4-212-590-11	HOLDER (FL)			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			
		< CAPACITOR >			
C101	1-128-551-11	ELECT	22uF	20%	25V
C102	1-126-963-11	ELECT	4.7uF	20%	50V
C103	1-163-012-00	CERAMIC CHIP	0.0018uF	5%	50V
C111	1-126-933-11	ELECT	100uF	20%	16V
C112	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-128-551-11	ELECT	22uF	20%	25V
C152	1-126-963-11	ELECT	4.7uF	20%	50V
C153	1-163-012-00	CERAMIC CHIP	0.0018uF	5%	50V
C161	1-126-934-11	ELECT	220uF	20%	10V
C162	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C171	1-126-925-11	ELECT	470uF	20%	10V
C201	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C202	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C203	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C204	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C206	1-126-934-11	ELECT	220uF	20%	10V
C207	1-126-934-11	ELECT	220uF	20%	10V
C301	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C302	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C303	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C401	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C402	1-126-963-11	ELECT	4.7uF	20%	50V
C451	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C452	1-126-963-11	ELECT	4.7uF	20%	50V
C501	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C502	1-163-038-91	CERAMIC CHIP	0.1uF		25V

MAIN

Ref. No.	Part No.	Description			Remark
C503	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C504	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C505	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C506	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C507	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C508	1-126-934-11	ELECT	220uF	20%	10V
C509	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C601	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C602	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C603	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C702	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C703	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C704	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C706	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C793	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
⚠C801	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C802	1-113-920-11	CERAMIC	0.0022uF	20%	250V
C811	1-126-939-11	ELECT	10000uF	20%	16V
C813	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C814	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C815	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C821	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C822	1-126-964-11	ELECT	10uF	20%	50V
C823	1-126-933-11	ELECT	100uF	20%	16V
C824	1-126-934-11	ELECT	220uF	20%	10V
C825	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C826	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C831	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C832	1-126-933-11	ELECT	100uF	20%	16V
C833	1-126-916-11	ELECT	1000uF	20%	6.3V
C841	1-126-933-11	ELECT	100uF	20%	16V
C842	1-126-933-11	ELECT	100uF	20%	16V
C851	1-128-551-11	ELECT	22uF	20%	63V
C852	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C853	1-126-967-11	ELECT	47uF	20%	50V
C854	1-126-965-11	ELECT	22uF	20%	35V
C855	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C856	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C861	1-128-551-11	ELECT	22uF	20%	25V
C862	1-126-964-11	ELECT	10uF	20%	50V
C863	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C871	1-126-916-11	ELECT	1000uF	20%	6.3V
		< CONNECTOR >			
CN501	1-784-418-11	CONNECTOR, FFC(LIF(NON-ZIF)21P			
* CN701	1-568-934-11	PIN, CONNECTOR 7P			
CN702	1-784-417-11	CONNECTOR, FFC(LIF(NON-ZIF)23P			
* CN791	1-568-832-11	SOCKET, CONNECTOR 13P			
CN792	1-506-468-11	PIN, CONNECTOR 3P			
* CN793	1-568-951-11	PIN, CONNECTOR 2P			
* CN801	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
CN802	1-564-321-00	PIN, CONNECTOR 2P			
CN821	1-568-683-11	PIN, CONNECTOR (PC BAORD) 2P			
		< DIODE >			
D172	8-719-988-61	DIODE 1SS355TE-17			
D173	8-719-988-61	DIODE 1SS355TE-17			
D811	8-719-200-82	DIODE 11ES2			

Ref. No.	Part No.	Description	Remark
D812	8-719-200-82	DIODE 11ES2	
D815	8-719-016-74	DIODE 1SS352	
D816	8-719-016-74	DIODE 1SS352	
D821	8-719-988-61	DIODE 1SS355TE-17	
D823	8-719-200-82	DIODE 11ES2	
D824	8-719-988-61	DIODE 1SS355TE-17	
D851	8-719-200-82	DIODE 11ES2	
D852	8-719-976-96	DIODE DTZ4.7C	
D861	8-719-988-61	DIODE 1SS355TE-17	
		< GROUND PLATE >	
* EP801	4-962-200-11	PLATE (TR), GROUND	
		< FERRITE BEAD >	
FB201	1-500-445-21	FERRITE 0UH	
FB202	1-216-295-91	SHORT 0	
FB204	1-216-295-91	SHORT 0	
FB221	1-216-295-91	SHORT 0	
FB222	1-216-295-91	SHORT 0	
FB223	1-216-295-91	SHORT 0	
FB505	1-216-295-91	SHORT 0	
FB601	1-500-445-21	FERRITE 0UH	
FB602	1-500-445-21	FERRITE 0UH	
FB603	1-500-445-21	FERRITE 0uH	
FB607	1-216-295-91	SHORT 0	
FB608	1-216-295-91	SHORT 0	
		< IC >	
IC101	8-759-357-68	IC NJM2115M-TE2	
IC201	8-759-553-65	IC UDA1341TS/N2	
IC301	8-759-822-09	IC LB1641	
IC501	8-749-923-05	IC TORX178A (DIGITAL OPTICAL IN1 CD)	
IC502	8-749-923-05	IC TORX178A (DIGITAL OPTICAL IN2 CS/BS)	
IC503	8-749-923-04	IC TOTX178 (DIGITAL OPTICAL OUT)	
IC601	8-759-269-92	IC SN74HCU04ANS-E20	
IC701	8-759-585-60	IC M30624MG-A01FP	
IC702	8-759-195-02	IC TC7S86F-TE85L	
IC821	8-759-445-59	IC BA033T	
IC822	8-759-565-74	IC M62016FP-E1	
IC831	8-759-231-53	IC TA7805S	
IC851	8-759-633-42	IC M5293L	
IC861	8-759-242-70	IC TC7WU04F	
		< JACK >	
J101	1-695-188-31	JACK, PIN 4P (MD IN/OUT)	
		< JUMPER RESISTOR >	
JW126	1-216-296-91	SHORT 0	
JW127	1-216-295-91	SHORT 0	
JW135	1-216-295-91	SHORT 0	
JW136	1-216-295-91	SHORT 0	
JW137	1-216-295-91	SHORT 0	
JW138	1-216-296-91	SHORT 0	
JW139	1-216-296-91	SHORT 0	
JW140	1-216-295-91	SHORT 0	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
		< COIL >			
L501	1-414-396-21	INDUCTOR	4.7uH		
		< LINE FILTER >			
LF801	1-424-485-11	FILTER, LINE			
		< TRANSISTOR >			
Q101	8-729-107-45	TRANSISTOR	2SC3624A-L16		
Q151	8-729-107-45	TRANSISTOR	2SC3624A-L16		
Q171	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q301	8-729-600-22	TRANSISTOR	2SA1235-F		
Q302	8-729-027-59	TRANSISTOR	DTC144EKA-T146		
Q791	8-729-027-36	TRANSISTOR	DTA143XKA-T146		
Q792	8-729-027-57	TRANSISTOR	DTC143XKA-T146		
Q831	8-729-040-20	TRANSISTOR	RT1P137L-TP		
Q832	8-729-027-57	TRANSISTOR	DTC143XKA-T146		
Q841	8-729-281-53	TRANSISTOR	2SC1815-GR		
		< RESISTOR >			
R101	1-216-073-00	METAL CHIP	10K	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-081-00	METAL CHIP	22K	5%	1/10W
R104	1-216-082-00	RES,CHIP	24K	5%	1/10W
R105	1-216-049-91	RES,CHIP	1K	5%	1/10W
R106	1-216-089-91	RES,CHIP	47K	5%	1/10W
R107	1-216-025-91	RES,CHIP	100	5%	1/10W
R111	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R113	1-500-445-21	FERRITE	0uH		
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R153	1-216-081-00	METAL CHIP	22K	5%	1/10W
R154	1-216-082-00	RES,CHIP	24K	5%	1/10W
R155	1-216-049-91	RES,CHIP	1K	5%	1/10W
R156	1-216-089-91	RES,CHIP	47K	5%	1/10W
R157	1-216-025-91	RES,CHIP	100	5%	1/10W
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R171	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R172	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R201	1-216-033-00	METAL CHIP	220	5%	1/10W
R202	1-216-033-00	METAL CHIP	220	5%	1/10W
R203	1-216-033-00	METAL CHIP	220	5%	1/10W
R204	1-216-025-91	RES,CHIP	100	5%	1/10W
R205	1-216-073-00	METAL CHIP	10K	5%	1/10W
R301	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R302	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R303	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R401	1-216-049-91	RES,CHIP	1K	5%	1/10W
R402	1-216-097-91	RES,CHIP	100K	5%	1/10W
R403	1-216-075-00	METAL CHIP	12K	5%	1/10W
R451	1-216-049-91	RES,CHIP	1K	5%	1/10W
R452	1-216-097-91	RES,CHIP	100K	5%	1/10W
R453	1-216-075-00	METAL CHIP	12K	5%	1/10W
R501	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R502	1-216-089-91	RES,CHIP	47K	5%	1/10W
R503	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R504	1-216-089-91	RES,CHIP	47K	5%	1/10W
R505	1-216-033-00	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description			Remark
R601	1-216-089-91	RES,CHIP	47K	5%	1/10W
R602	1-216-089-91	RES,CHIP	47K	5%	1/10W
R605	1-216-121-91	RES,CHIP	1M	5%	1/10W
R606	1-216-025-91	RES,CHIP	100	5%	1/10W
R607	1-216-025-91	RES,CHIP	100	5%	1/10W
R608	1-216-025-91	RES,CHIP	100	5%	1/10W
R609	1-216-049-91	RES,CHIP	1K	5%	1/10W
R621	1-500-445-21	FERITE	0uH		
R703	1-216-073-00	METAL CHIP	10K	5%	1/10W
R704	1-216-073-00	METAL CHIP	10K	5%	1/10W
R705	1-216-073-00	METAL CHIP	10K	5%	1/10W
R706	1-216-073-00	METAL CHIP	10K	5%	1/10W
R707	1-216-073-00	METAL CHIP	10K	5%	1/10W
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W
R709	1-216-073-00	METAL CHIP	10K	5%	1/10W
R710	1-216-073-00	METAL CHIP	10K	5%	1/10W
R712	1-216-073-00	METAL CHIP	10K	5%	1/10W
R713	1-216-073-00	METAL CHIP	10K	5%	1/10W
R714	1-216-073-00	METAL CHIP	10K	5%	1/10W
R715	1-216-073-00	METAL CHIP	10K	5%	1/10W
R716	1-216-073-00	METAL CHIP	10K	5%	1/10W
R720	1-216-073-00	METAL CHIP	10K	5%	1/10W
R721	1-216-073-00	METAL CHIP	10K	5%	1/10W
R722	1-216-295-91	SHORT	0		
R724	1-216-073-00	METAL CHIP	10K	5%	1/10W
R725	1-216-025-91	RES,CHIP	100	5%	1/10W
R726	1-216-025-91	RES,CHIP	100	5%	1/10W
R727	1-216-025-91	RES,CHIP	100	5%	1/10W
R728	1-216-025-91	RES,CHIP	100	5%	1/10W
R729	1-216-073-00	METAL CHIP	10K	5%	1/10W
R730	1-216-025-91	RES,CHIP	100	5%	1/10W
R789	1-216-025-91	RES,CHIP	100	5%	1/10W
R821	1-216-073-00	METAL CHIP	10K	5%	1/10W
R822	1-216-045-00	METAL CHIP	680	5%	1/10W
R832	1-216-295-91	SHORT	0		
R841	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R852	1-216-097-91	RES,CHIP	100K	5%	1/10W
⚠R853	1-216-033-00	METAL CHIP	220	5%	1/10W
R854	1-216-033-00	METAL CHIP	220	5%	1/10W
R855	1-215-881-11	METAL OXIDE	15	5%	2W F
R861	1-216-033-00	METAL CHIP	220	5%	1/10W
R862	1-216-047-91	RES,CHIP	820	5%	1/10W
R863	1-216-037-00	METAL CHIP	330	5%	1/10W
R864	1-216-081-00	METAL CHIP	22K	5%	1/10W
R865	1-216-111-00	METAL CHIP	390K	5%	1/10W
R866	1-216-091-00	METAL CHIP	56K	5%	1/10W
R1001	1-216-295-91	SHORT	0		
		< VIBRATOR >			
X601	1-579-314-11	VIBRATOR, CRYSTAL (22.5792MHz)			
X701	1-579-175-11	VIBRATOR, CERAMIC (10MHz)			

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
*	A-4724-619-A	PANEL BOARD, COMPLETE **********			
		< CAPACITOR >			
C901	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C902	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C903	1-123-618-11	ELECT	22uF	20%	6.3V
C921	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C922	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C923	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C924	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C931	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C948	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
		< CONNECTOR >			
* CN901	1-568-856-21	SOCKET, CONNECTOR 13P			
		< DIODE >			
D941	8-719-058-04	DIODE SEL5223S-TP15 (● REC)			
D942	8-719-058-04	DIODE SEL5223S-TP15 (CD SYNC/MD WM SYNC)			
D943	8-719-072-76	DIODE SEL5E23C-TP15 (▷▷⏭/▶▶)			
D944	8-719-072-76	DIODE SEL5E23C-TP15 (⏮◁◁/◀◀)			
D945	8-719-072-76	DIODE SEL5E23C-TP15 (□)			
D946	8-719-072-76	DIODE SEL5E23C-TP15 (▷⏯)			
		< FLUORESCENT INDICATOR >			
FL901	1-517-804-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC901	8-759-572-22	IC MSM9202-02GS-KR1			
		< TRANSISTOR >			
Q921	8-729-027-56	TRANSISTOR DTC143TKA-T146			
Q941	8-729-027-59	TRANSISTOR DTC144EKA-T146			
Q942	8-729-027-59	TRANSISTOR DTC144EKA-T146			
		< RESISTOR >			
R901	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R902	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R903	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R904	1-216-073-00	METAL CHIP	10K	5%	1/10W
R905	1-216-085-00	METAL CHIP	33K	5%	1/10W
R906	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R907	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R908	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R909	1-216-073-00	METAL CHIP	10K	5%	1/10W
R910	1-216-085-00	METAL CHIP	33K	5%	1/10W
R921	1-216-025-91	RES,CHIP	100	5%	1/10W
R922	1-216-025-91	RES,CHIP	100	5%	1/10W
R923	1-216-025-91	RES,CHIP	100	5%	1/10W
R924	1-216-025-91	RES,CHIP	100	5%	1/10W
R931	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R941	1-216-021-00	METAL CHIP	68	5%	1/10W
R942	1-216-021-00	METAL CHIP	68	5%	1/10W
R944	1-216-034-00	METAL CHIP	240	5%	1/10W
R945	1-216-034-00	METAL CHIP	240	5%	1/10W
R946	1-216-034-00	METAL CHIP	240	5%	1/10W
R947	1-216-034-00	METAL CHIP	240	5%	1/10W
R948	1-216-089-91	RES,CHIP	47K	5%	1/10W
		< SWITCH >			
S901	1-762-875-21	SWITCH, KEYBOARD (⏏)			
S902	1-762-875-21	SWITCH, KEYBOARD (CLEAR)			
S903	1-762-875-21	SWITCH, KEYBOARD (ENTER/YES)			
S904	1-762-875-21	SWITCH, KEYBOARD (MENU/NO)			
S905	1-762-875-21	SWITCH, KEYBOARD (▷▷⏭/▶▶)			
S906	1-762-875-21	SWITCH, KEYBOARD (⏮◁◁/◀◀)			
S907	1-762-875-21	SWITCH, KEYBOARD (□)			
S908	1-762-875-21	SWITCH, KEYBOARD (▷⏯)			
S909	1-762-875-21	SWITCH, KEYBOARD (CD SYNC/MD WM SYNC)			
S910	1-762-875-21	SWITCH, KEYBOARD (● REC)			
S911	1-762-875-21	SWITCH, KEYBOARD (DISPLAY)			
S912	1-762-875-21	SWITCH, KEYBOARD (⏻)			
*	1-671-539-11	PANEL SW BOARD **********			
		< SWITCH >			
S991	1-771-516-11	SWITCH, PUSH(DETECTION)(1 KEY)			
*	1-671-115-21	SW BOARD ********			
		< CONNECTOR >			
CN601	1-506-486-11	PIN, CONNECTOR 7P			
		< SWITCH >			
S601	1-572-126-21	SWITCH, PUSH (1 KEY)(REC POSITION)			
S602	1-572-126-21	SWITCH, PUSH (1 KEY)(PACK OUT)			
S604	1-771-264-11	SWITCH, PUSH(DETECTION)(1 KEY) (PB POSITION)			
		MISCELLANEOUS **********			
2	1-783-140-11	WIRE (FLAT TYPE) (23 CORE)			
3	1-783-139-11	WIRE (FLAT TYPE) (21 CORE)			
6	1-769-969-11	WIRE (FLAT TYPE) (13 CORE)			
⚠8	1-783-499-11	CORD, POWER			
14	1-569-972-21	SOCKET, SHORT 2P			
66	1-751-086-11	WIRE (FLAT TYPE) (13 CORE)			
⚠260	8-583-028-02	OPTICAL PICK-UP KMS-260A/J1NP			
⚠CNJ802	1-526-794-11	OUTLET, AC			
FL901	1-517-804-11	INDICATOR TUBE, FLUORESCENT			
HR901	1-500-502-11	HEAD, OVER LIGHT			
M101	A-4672-475-A	MOTOR ASSY, SPINDLE			
M102	A-4672-474-A	MOTOR ASSY, SLED			
M103	X-4949-264-1	MOTOR ASSY, LOADING			
S102	1-762-148-21	SWITCH, PUSH (2 KEY)			
⚠T801	1-431-685-31	TRANSFORMER, POWER			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-543-793-11	FILTER, CLAMP (FERRITE CORE)	
	1-558-271-11	CORD, CONNECTION (AUDIO, 108cm)	
	1-574-264-11	CORD, OPTICAL PLUG (OPTICAL PLUG, 60cm)	(AEP,UK)
	1-790-034-11	CORD (WITH CONNECTOR) (5 CORE) (SYSTEM CABLE, 50cm)	
	1-790-137-11	CORD (WITH CONNECTOR) (WALKMAN-LINK, 80cm)	
	3-864-771-11	MANUAL, INSTRUCTION (ENGLISH)	
	3-864-771-21	MANUAL, INSTRUCTION (FRENCH,SPANISH)	(AEP,UK)
	3-864-771-31	MANUAL, INSTRUCTION (ITALIAN,PORTUGUESE)	(AEP,UK)
	3-864-771-41	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH)	(AEP,UK)
	3-864-771-51	MANUAL, INSTRUCTION (CHINESE)	(SP,HK)

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HARDWARE LIST
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#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-685-532-14	SCREW +BTP 2.6X5 TYPE2 N-S	
#3	7-685-871-01	SCREW +BVTT 3X6 (S)	
#4	7-621-772-20	SCREW +B 2X5	
#5	7-621-772-40	SCREW +B 2X8	
#6	7-627-852-08	SCREW,PRECISION +P 1.7X2.5	
#7	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
#8	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	

9-922-970-11

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Home A&V Products Company

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